MODEL AIRPLANE NEWS

MAY 1954 — 35 CENTS

IN THIS ISSUE

WYLAM

Masterplans Of The

FORD TRI-MOTOR

Look Fellows!

A BIG 30 INCH PROFILE BASIC TRAINER

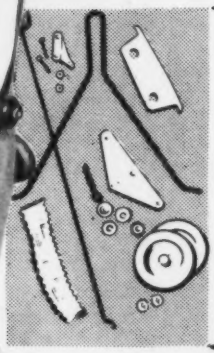
constructed to stand terrific abuse

$3.95

WING SPAN 30 inches
Engine .14 to .19 disp.

motor, flying equipment and liquids not supplied.

- **AMAZING FLYING ABILITY**
- **BEAUTIFULLY PRE-FABRICATED**
- **ALL NEEDED ACCESSORIES**
- **NEW FIXED FLAP DESIGN** that eliminates offset rudder, offset motor and wing tip weight for easier flying.
- **IMPROVED DESIGN** of the very popular Trixter Trainer, developed by the knowledge obtained out in the field through study of the beginner's requirements.



Here's what you get with this smartly designed kit:

Complete bellcrank assembly.
Elevator horn with mounting bolts.
Wheels. Wheelocks.
Hinging material. Finished push rod.
Finished landing gear.
Finished wing tip line guide.

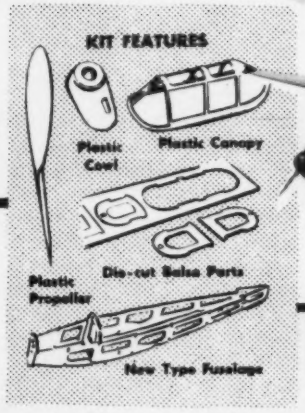
COMPLETELY PRE-FABRICATED. Hard wood motor mount. All can be assembled in a jiffy.

The Best Yet! Really New!
3 FLYING MODEL KITS

Ready for you at your hobby store.

Kit 50-1
North American Trainer T-28
16" Wing Span

These three additions to the Guillow fifty-cent line have the new one-piece side frame construction that saves you a lot of time. Note the gleaming plastic canopy, propeller, and cowl to give strength and beauty. All die-cut balsa construction. Clearly illustrated step by step plans will help you make a beautiful plane that is designed to really fly. If you want the best buy Guillow designed kits.



Kit 50-2
DeHavilland Chipmunk
17" Wing Span

Kit 50-3
Cessna L1 Bird Dog
18" Wing Span

Eight other models for your collection . . .
with all the features of the three new models but without one piece side construction and plastic canopy.

BRITISH SE-5
KIT 50-4

CESSNA
KIT 50-5

WACO CUSTOM
KIT 50-6

MONOCOUPE
KIT 50-7

AERONCA CHAMPION
KIT 50-8

HAWKER HURRICANE
KIT 50-9

SPITFIRE
KIT 50-10

VOUGHT CORSAIR
KIT 50-11

50¢ each

Note large wing span.

GUILLOW'S

If not available at your Hobby Dealer, send direct to factory adding 25c for packing and postage in U. S. A., 40c outside U. S. A.

PAUL K. GUILLOW

WAKEFIELD, MASS.

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Ask anybody who owns a Jim Walker "Firebaby" and he'll tell you that it will take a lot of punishment. But when you try to stretch your luck too far — or get a little fancy on that last loop — well, something has to give. And if that happens to you, see your A-J dealer. He has extra parts to keep your Firebaby flying! Available with or without engine, single wing or biplane. See your dealer today!

With engine, as low as **$7.85**
Without engine, from **$2.50**

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MODEL AIRPLANE NEWS

25th Year of Publication

MAY 1954 Vol. L—No. 5

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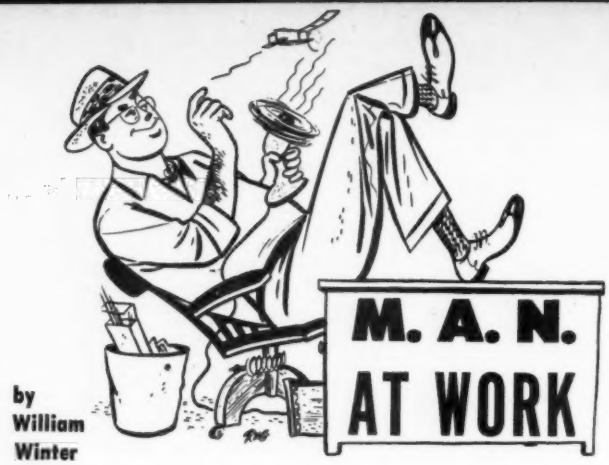

by William Winter

When, two months ago, this column defined MAN's future policy, in view of trends in our field, it was little suspected that modelers were taking such keen interest in these matters. Even as this is written, every mail brings more letters. It will take weeks to evaluate the many comments and suggestions. And it is difficult, indeed, to compress into this small space even the highlights of this "reader reaction" file. Without exception these letters were thought provoking and helpful. Many were masterful discussions. But one, in particular, summed up concisely the situation that prompted this outpouring of good will.

"Frankly, I'm extremely pleased to see you reaffirm your policy of keeping MAN a 'rallying place for model plane hobbyists,'" said Roger F. George, Washington, D. C. "Each individual does (and should) have his own ideas about what the mag should contain. I'm a Johnny-come-lately RC boy myself, but I feel that to be fair to all, you should continue, as you seem to have attempted, in the past, to present rather a broad, over-all picture, and offering of material, rather than concentrate on one phase of the hobby, to the exclusion of the other.

"In general, then," continued Mr. George, "keep up the good work, and run MAN the way it should be run, not as a magazine containing model planes, boats, cars, mechanics, contests and science."

And this in the same vein, for instance, from William R. Booker, Cape Girardeau, Mo., "May I say a fervent amen, and otherwise indicate complete agreement with your statement of future policy for MAN. Thank Heavens there will be one rallying place for model plane hobbyists left... MAN as it is offers a well-rounded, balanced blend of all types of models. The minority interests should (*Continued on page* 8)

PLANE ON THE COVER

Possibly the top fighter of World War I, the French Spad was extensively used by American airmen because we entered the war late. Eddie Rickenbacker, leading U.S. ace of that war, made famous in this country the SPAD and the Hat-in-the-Ring Squadron of American pilots. The machine was an equal span biplane of 26 ft. 5 in. spread, powered by either a 200 or 220 hp Hispano Suiza liquid-cooled engine. Twin .30 caliber machine guns synchronized to fire through the propeller, as they have just done in Jo Kotula's sparkling action painting.

NEXT MONTH'S COVER

One of a trio of standard high speed British atom bombers is the Handley Page Victor, featured on the June cover. Distinguished by its odd crescent shaped wing planform, it is one of the world's most unusual aircraft. Four Armstrong Siddeley Sapphire Turbojets, each of over 8,000 pounds' thrust, probably give the big machine a speed approximating that of our B-47.

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1 New Engine

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A WINNER . . . FOR POWER! This powerful new Cub is ideal for contest entries. Engineered to provide maximum Class A performance. Has the highest output on a power/weight ratio of any engine now on the market!

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Bore	.655
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Weight	2⅞ oz.

$8.95
As illustrated

To make sure your Cub's a winner, always use "OK" Glow Fuel. A methanol-base fuel with extra punch. Assures quick firing, complete combustion — leaves no varnish or residue.

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"OK"
CUB .049B
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"OK" CUB .074
$5.95

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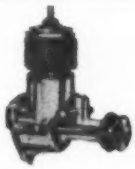
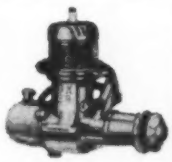
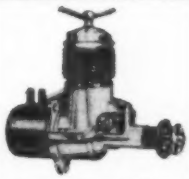
$6.95



"OK" CUB .14
$7.95



"OK" HOTHEAD
$10.95



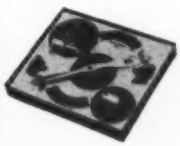
"OK" CUB DIESELS
.049 $5.95
.075 $7.50

2 New Kit

OK CUB .049B POWER KIT

A WINNER . . . FOR PRICE! Enjoy the thrill of assembling your own engine—and save money at the same time! Kit contains all the parts you need and easy-to-follow instructions.

only $3.95



"OK" COMBINATION PACKAGES
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CUB .074 . . . . . $6.75
CUB .099 . . . . . $7.75

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Re-usable Trigger Valve

19¢

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Hot Fuel Proof Plastic Balsa Big Tube **30¢**

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Aero Gloss Plane Kleener 8 oz. Can **50¢**

Aero Gloss Hot Fuel Proof Clear Dope Economy Pint Can **$1.59**

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Aero Gloss Hot Fuel Proof Transparent Colors 4oz. **60¢**

1oz. **20¢**

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TRADE SHOW

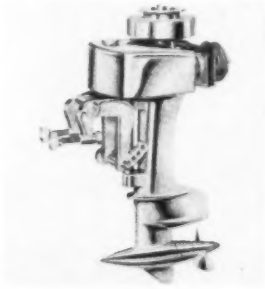
MONTHLY REVIEW OF NEW PRODUCTS, OTHER INTERESTING ITEMS WORTH ATTENTION

▸ *American Boy Stunt Trainer:* Scientific Model Airplane Co., Newark, N. J., prices this little 18 in. U-control trainer at $1. It's a profile job, easy to assemble and fly. Powerplants range from .02 to .074, the manufacturer states. Engine is side-mounted type. Is real looking when color trimmed.

▸ *Cutlass and Cougar:* Two new additions to the plastic model construction kits by Revell, Inc., of Venice, Calif.—Grumman Cougar shown. Both models are priced at 59¢, along with the earlier Lockheed Starfire, slightly higher in Canada. All three available in one box. Models are authentic.

▸ *Aerogloss Wax:* Increasing emphasis on good finishes and attractively painted airplanes, suggests final touch of waxing finished job. Unblemished finishes result from use of rubbing compound (another Aerogloss item), before top coats, waxing. Wax is 40¢. Pactra Chemical Co., Los Angeles.

▸ *Gasoline Outboard:* Exciting outboard marine engines finally available for boat fans. Allyn Sales Co., Los Angeles, Sky Fury, realistically duplicated full scale types. It is



adjustable for angle, and clamps to boat transom. Pulley at top allows easy pull cord starting. Tank and needle valve readily accessible for filing and adjustment. No need to stick air props and engines on pylons!

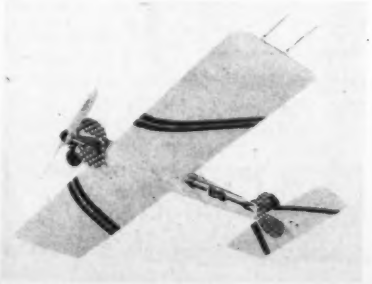
▸ *Guillow Profile Trainer:* Revised basic trainer is easy to assemble and takes the hard knocks of beginners' first flights. Fixed wing flaps eliminate need for offset thrust

line or rudder. Completely prefabricated, kit spans 29-1/2 in., takes engines from .14 to .19 displacement. Manufactured by Paul K. Guillow, Wakefield, Mass., lists at $3.95. Profile canopy adds a note of realism.

▸ *Atwood's Outboard:* Capable of driving a boat up to 30 mph, Atwood Motors' (Montrose, Calif.) new outboard type is lifelike adaptation for marine use of the

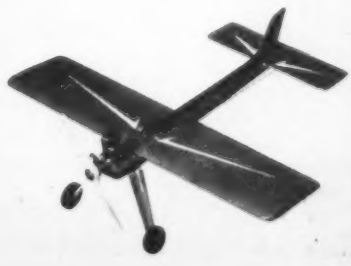
familiar Atwood .049 airplane engine. Retailing under $10, it is adjustable for thrust angle, and for steering in a circle. The inboard version has a water jacket and ingenious cooling even when standing still.

▸ *Woodchopper:* Genuine stunt-combat ship for engines of .19 to .35 displacement, this job by Amcraft, Schenectady, N. Y., has special built-in features of importance to combat fliers. Ship is light and very fast, and has high order of maneuverability. All parts pre-shaped and die-cut. Retails $2.95.



▸ *Sterling Chris-Craft:* This motor boat to end all boats is a 40 in. long model of the 63 ft. Chris-Craft Motor Yacht. For shelf, power boating and RC. Completely prefabbed. Takes electric or gas engines. Made by Sterling Models, Philadelphia, it lists at $18.95. A cast metal fitting set for $7.50.

▸ *F & B's Trainer:* Ultimate simplicity is keynote of F & B Model Aircraft Co. (Denver, Colo.) Basic Trainer. Only seven parts to cement and bolt together, aluminum landing gear, complete hardware. Takes engines of .14 to .35 displacement. Flat fuselage, T-backbone, strong and simple. $2.95.



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Baby Zephyr 28"		.98
Badger 72" A-B-C		5.95
Bandit 44"	AA	2.95
Bird Dog 36" FF	AA	2.75
Bootstrap 40"	AA	2.50
Buccaneer II Scale/ 54"	B	7.50
Champion 36" A-AA		2.50
Clipper 34"	AA	2.95
Cloud-Coaster TR 25"	AA	2.50
Cloud-Coaster D2 26"	AA	2.95
Commander 36"	AA	2.75
Cobata 24"	AA	2.75
Fully 32"	AA	1.79
Fu-bar 24"	AA	1.50
Fu-bar 60 60"	B-C	6.95
Fu-bar 72"	C	9.95
Hallowaine 39"	AA	2.95
Jesco Rival 44"	AA	2.75
Jesco Streak 33"	AA	2.50
Junior Mission 36"	A	2.75
KIWI 36"	AA	2.50
KIWI 44"	A	4.50
KIWI ABC 61"	A-B-C	6.95
Lil' Master 30"	AA	2.50
Lil Rascal 27"	AA	1.50
Luscombe Sedan 76"	C-D	7.50
Mini-Hogan 34 3/4"	AA	1.95
Mini-Hogan 45 45"	AA	2.95
Navaio 36"	AA	2.50

Buried in This Ad
are most of the new items. Sometimes there isn't time or space to list all of them. But, if available anywhere, we have it.

PAA Master 35"	AA	2.50
Pacemaker 40"	AA	2.50
Powerhouse 41"	A	2.75
Powerhouse 41"	A	2.95
Powerhouse 56"	B	4.95
Pinetree Pete Bird 36" FF	AA	2.95
Profile Powerhouse 26"	AA	1.00
Sandy Hogan 70"	B-C	9.95
Shadow 32"	AA	1.95
Skeet 36"	AA	2.50
Skeet 31"	AA	1.79
Skiffer 29"	AA	1.79
Speed Bipe/Kit 36"	B	3.95
Taylor Cub 35"	AA	2.95
Test 23"	AA	1.50
Test 33"	AA	2.50
Zeek 50"	A-B	4.95

RADIO CONTROL PLANES

Four Tri-Pacer 39"	A-B-C	10.95
Bootstrapper 40" Kit	SF AA-A	2.95
Brigadier RC 35"	AA-A	1.95
Bambi Runner 72"	A-B-C	10.95
Kitten 24"	AA	3.95
Live-wire RC 48"	AA-A	4.95
Mercury Cruiser 66"	A-B	6.95
Revel Rudderbug 42"	A	4.95
Runaway Sr. 68"	B	14.95
Buccaneer II Special 54"	B	7.95
Buccaneer C Special 72"	C	7.95
Super Buccaneer 56"	B	9.95
Super Buccaneer 90"	C-D	10.95
Custom Cavalier 100"	D-E	17.50
Luscombe Sedan 76"	C-D	7.50

U-CONTROL PLANES

A/2 Twin 29½"	AA	2.95
Aeronca Sedan 28½"	A-B-C	4.95
Aeronca Sedan 22"	AA	1.95
Agronite 17"	AA	4.95
Air Racer 18"	AA-A	3.39
All Amer. Trainer 21"	AA	1.75
All Amer. Stunt Trainer Jr. 30"	AAA	2.50
All Amer. Stunt 36"	A-B	4.95
All Amer. Sr. Stunt 51"	B-C	8.95
Aeronca Sr. 18"	AA	1.50
Baby Betafarmer 23"	AA	2.95
Baby Clown 22"	AA	1.50
Baby Sig 18"	AA-A	2.50
Baby Sig Ring 16"	AA	2.50
Betafarmer 36"	A-B	5.95
Beechcraft 16"	AA-A	2.95
Bearcat 18"	AA-A	2.95
Bee Stunt Train. 22"	B-C-D	3.95
Bowling Pitch 17½"	AA	1.95
Bowling Pitch 24"	A	2.95
Brave 36"	A-B-C	4.75
Chief's Wisdom 40"	A-B-C	6.95
Cosmic 22"	AA	1.95
Cosmic 36"	B-C	5.95
Cloud 85"	B-C	7.95
Cross Keys 40"	B-C	2.95
Combat Sky Bug 36"	A-B	2.95
Corsair 17"	A-AA	2.95
Curtis P40C 20"	AA	3.95
Curtiss Hawk P6E 17½"	AA	4.95
Curtiss Hawk P6E 23⅝"	A	4.95
Dynamic 26"	A-B	3.50
Fire Baby 19"	AA	1.95
Fireboby (incl. Engine)		7.85
Fireboby Biplane 19"	AA	3.50
Fireboby Biplane (incl. engine)		7.85
Flip-Flop 24"	A-B	3.50
Flying Clown 28"	A-B-C	3.95
Focke Wolfe 190 17"	AA	2.95
Fokker D-VII 32½"	UC A-B-C	5.95
Fokker D7 16"	AA	2.95
Good News 39"	A-B-C	5.95
Good News Trainer 27"	A-B	3.95
Grumman Goodson 50"	A-B-C	5.95
Guided Star 26"	A-B-C	5.95
Guided Star Trainer 17"	AA	2.95
Hall—Racer 9"	AA	1.00
Hall—Racer 17"	AA	2.95
Hall—Racer 15"	B	6.50
Hall—Racer 18"	D	6.95
Hangar Queen 36"	A	4.95
Harvard Pete 30"	B-C-D	5.95
Inland Wagon 20"	AA	1.95
Junior Bomber 17"	AA	2.95
Junior Stunt 9 27"	AA-A	3.48
Junior Stunt 19 34"	A	4.95
Junior Stunt 29 40"	B	6.95
Kashi Panther 48"	B-C	6.95
Kashi Wildcat 37"	A-B	4.95
Kashi Bobcat 37"	A-B	4.95
Kashi Cougar 51"	B-C	6.95
Kashi Mustang 48"	B-C	6.95
Key 29"	B-C	5.95
Kwik-Det 24"	AA-A	2.95
Knockout 18"	AA	2.50
Lil Duster Zilch 42"	A-B	3.95
Little Ace 18"	AA-A	1.95
Little Bipe 16"	AA-A	1.50
Little Devil 18"	AA-A	1.50
Little Marauy 18"	AA	1.50
Little Mustang 18"	AA	1.50
Little Sabre 18"	AA	1.95
Lockheed Starfire 23"	Jetex	2.49
MPC-7 39"	B	5.95
ME 109 Jr. (P.D.O.) 20"	AA	1.50
Minnow 28"	A-B-C	3.95
Mini-Zilch 19"	AA	2.95
Monocoupe 36"	B-C	4.95
Monocoupe 90 A"	AA	1.50
Mr. Mullican 32"	B-C (Sterling)	4.95
Mustang 37"	A-B (Berkeley)	5.95
Mustang (Stanley) 24"	A-B-C	3.95
Mustang (Veco) 48"	B-C	7.95
Mustang (Enterprise) 19½"	AA-A	2.95
Mustang (Monarch) 20"	AA-A	2.95
N.A. P51 16"	AA (Cox)	2.95
No. Amer. AT6 (ENL) 31"	A-B-C	4.95
No. Amer. AT6 18"	AA	2.95
N. A. Savage 36"	AA	2.95
Papoose 32"	AA	2.95
Peter Pan 16"	AA	1.50
Piper Cub 22"	AA	1.95
Piper Cub 39½"	A-B-C	4.95
Piper Vacationer 36"	A-B-C	4.95
Pitts Special 25"	A-B	3.95
Polish Fighter 36"	B-C-D	4.95
Power 17"	AA	1.40
PT Trainer 26"	A-B	.99
Puddle Jumper 19"	AA	1.00
Quaker 30"	A	4.95
Radskin 31"	A-B	4.95
Ringmaster 42"	B-C	5.95
Ryan ST 36"	B-C	5.95
Ryan S.T. AA 17½"		2.50
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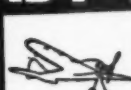

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MAN at Work

(*Continued from page 2*)

be represented as well as the majority."

• • •

▸ When it comes to publicity, the AMA and the FAI have a surprising tendency to hide their light under a bushel. It therefore becomes appallingly difficult to keep the American modeler up to date on important developments. Having just unsuccessfully tried to stop the presses on the April issue in order to include news of the Nationals—printed already in the February *Model Aviation*, the AMA's bulletin, having waited 10 days for the necessary confirmation—we direct your attention to the contest calendar, supplied by the courtesy of the AMA, under July listings, to wit: July 27-August 1, Chicago, Ill., Class AAAA 1954 National Championship Model Airplane Contest.

• • •

▸ On the other hand, no one will ever accuse the Western Associated Modelers of not sending out the dope. Copies of minutes that reach our work bench contain fascinating and useful info on all manner of developments. One item concerned a judges school for stunt. There's a full length set of rules for a Controlline Cargo Event—and what has held up this idea, first reported in the April, 1951 issue of MAN? There's another copy of WAM Controlline Flying Scale Rules. That Cargo ukie deal, incidentally, involves a displacement limit of .19 on one motor, or .60 total for all motors, .018 in. stranded 60-ft. line, 7-1/2 times model weight pull test, four consecutive laps at not less than 6 ft. altitude. Weight of the cargo in ounces is divided by the displacement of the motors—highest score for single flight wins. Any clubs interested in full details should write the WAM Secretary-Treasurer, Harvey S. Robbers, Sr., 5610 E. 17th St., Oakland 3, Calif. The December 11 minutes, from which these facts were gleaned, ran to nine pages, and not a wasted word.

• • •

▸ Another 10-page—about 60 lines, single spaced, to the page—document has been sent out to speed modelers by Victor Stanzel & Co., Schulenburg, Tex. This is an engineering type of report on monoline, and it is complete with statistics and drawings for monoline adapted to every class and size of speed model. Some of the Texas speed fliers have collaborated with Stanzel in working the bugs out of earlier systems—present installations are racking up top times, better than 150 mph for .60's. If you are interested in U-control make a point to obtain this very worth while treatise—and we are not handing out plugs! Leo Holliday, speed merchant (see Quick Sixty, this issue) and Nationals winner, brought this report to our attention.

Holliday makes speed sound so interesting, that he has us looking at our lumbering RC's with a jaundiced eye. For example: "I just hit 150.32 mph at the record trials with my new monoline ship. The real story," says Leo, "to come out of the trials was one of rags to riches. Leland Martin (stunt boy for five years) built a new speed ship (like the Quick Sixty except that it had dihedral in the wings) used very stock (borrowed!) fuel, stock 9 x 12 Tornado prop, and turned 155.11 mph for a new National record. Another boy did the same thing to the Senior Class B record. He had never flown speed before, first ship, first flight 127.8 mph to better record by over 2 mph." See what we mean? Give me a lend of that glow juice, Elmer, I've got a record to crack! Leo put some real gems in the Quick Sixty text—you should so always read directions!

• • •

▸ Now hear this, you scale fans: the Navy has (free!) large size three-view drawings

with the more pertinent details and markings of many of their aircraft. You can obtain these drawings by writing Lt. Cmdr. Richard D. Lazenby, Department of the Navy, Office of Information, Washington 25, D.C. Here's the list: *Vought*: VE-7 (before your Dad's time, perhaps!), Sea Wolf TBU-1, SBU-1, Cutlass, Corsair F4U-5N, Kingfisher, Corsair 02U-1, Vindicator. *North American*: Savage, SNJ (Yellow Peril trainer), Fury. *Douglas*: Dauntless, Skyraider, Skystreak. *Grumman*: Guardian, Panther F9F-5, Panther F9F-2, Albatross, Bearcraft F8F-2, Bearcat F8F-1. *McDonnell*: Banshee F2H-2P, Banshee F2H. *Lockheed*: Neptune.

* * *

▶ By way of a breather, want to tell you about our experiences—hey, boy, where you going?—with engines; crates, and so on. Torp .15 in RC, runs smooth as silk; those Cub Diesels, as hot as any glow engine, and the distinctive-smelling Cub Diesel fuel seems to have the pep; Amco 3.5 cc, one from Chinn, t'other from Hanson (Walter C. Hanson, International Hobbies, Albuquerque, N. M.). These are double ball bearing, rear rotor jobs designed by our own Ted Martin while yet in England. Hanson deserves a pat on the back for importing select items for the serious modeler. In addition to the Amco, considered the world's top Diesel in its class (about .21 displacement), he handles the Elfin 1.49 and 2.49, which also enjoy an enviable international reputation. Another Hanson item is the E.D. clockwork timer, range 0.45 seconds. High speed, potent stuff, and should wear and wear. And to the self-styled experts who have knocked the North American two-tubers: how's that? Every set we have seen has operated beautifully. One kit sent in, was assembled by a woman, who also built a sample Beam kit, in which hubby installed the radio. Range is all that could be asked for. This is one of the finest jobs in design, packaging and instruction for an RC kit that has come to our attention. Now flight testing the Citizen-Ship 27.255 receiver, and the single channel Babcock. The former leaves nothing to be desired. Have only two quick flights on the latter but looking forward to big doings. Certainly is nice not to worry about relay contacts and adjustments with the Babcock's sealed relay. Veco .29, pleasure to start and fly. Have it overpropped with a 12-8 on 6-1/2 lb. ship and pulls it up faster than you like. Space Bug samples: starts one flip when flipped slowly, impressive performance. Something about props: Torp .19 on Live Wire, steady climb out with 11-4. An 11-3 will pull it into the ground! Apparently, low pitches develop more thrust at low airplane speeds, before good lift is exerted. Now we know why some free flights—Leon Shulman's Banshee always got us!—go out straight, suddenly peel off and up like homesick angels. Prop pitch a prime method of controlling plane adjustments, for climb, speed, and angle, as well as torque and turn variations. Ties in with downthrust, probably.

* * *

▶ This reminds us of Ken Willard's problem posed in a recent column: Ship had slight left turn. For adjustment, a small weight was placed in right wing tip. Ship turned more to the left. Why? This time we have a reader answer, the correct one, from Bernard H. Paiewonsky, Bloomington, Ind. "In answer to the question raised in the February, 1954 MAN concerning the weighted wing and turns, I believe," states Mr. Paiewonsky, "that the addition of weight to the right wing panel will move the CG to the right of the fuselage center line. If the weights are small, the drag on the left side of the CG (hence, the turning moment) will be greater than the right turn tendency induced by the heavy right wing panel. As the weights are increased the CG moves farther right, but the effects of the heavy panel now cause the right wing to drop and the plane turns toward the right. This is usually observed in hand-launched gliders." This reverse reaction, up to a point, type of thing also accounts for so far unanswered questions in previous columns, as to how weight could be added to a nose and have the ship stall under power, or add downthrust and have the ship stall rather than dive in. And in both these cases, carrying the adjustment far enough and the reaction becomes normal. Toys, did they say?

* * *

▶ All reports indicate Pete Chinn's Internationalist scored a bull's eye, contest free flighters take note! Says L. C. Armstrong, Twin Cities Model Airplane Club, Yuba City-Marysville, Calif., "The Internationalist is widely flown in these parts and, in fact, has been winning over the .19-powered A's. Frank Hauser has a .29 version called the Nationalist that is a dream. Two others this size built." And Lyman goes on making music for our ears by musing, "Latest issues of MAN make me wonder why I subscribe to the English magazines. Chinn's articles are wonderful and this guy Martin is really the boy when it comes to engines."

* * *

▶ Until you have seen a Ceiling Walker event you haven't lived. The fun is worth the inevitable stiff neck from gawking skyward. Came across this account of a last year's contest, reported by Clarence Wells. Really better late than never, so here goes: "At 11 a.m. we began the event located between our parking lot and the contest (Bristol Aeromodelers) site right in the HL-glider area. Two large card tables were set up with one timer, and an assistant who took care of pre-assembling a few, the winder, etc.,

(*Continued on page 46*)

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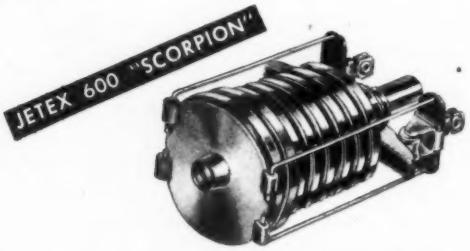
FUEL WEIGHT	.2oz.	.2oz.	.27oz.	.4oz.
TOTAL WEIGHT	.4oz.	.4oz.	1.00oz.	2.0oz.
THRUST (average)	.6oz.	.6oz.	1.75oz.	5.5oz.
THRUST with Aug. Tube	-----	.75oz.	2.25oz.	7.0oz.
THRUST duration	12 sec.	12 sec.	14 sec.	10 sec.
JET EXHAUST VELOCITY	1200 f/s	1300 f/s	1400 f/s	1600 f/s
OVERALL LENGTH	1 5/8"	1 7/8"	3 1/2"	2 1/4"
MAXIMUM DIAMETER	1 1/16"	1 1/16"	1"	1 1/4"
MODEL SIZE LIMIT (span)	16"	20"	36"	48"
MODEL WEIGHT LIMIT	1.5oz.	1.7oz.	5.0oz.	16.0oz.



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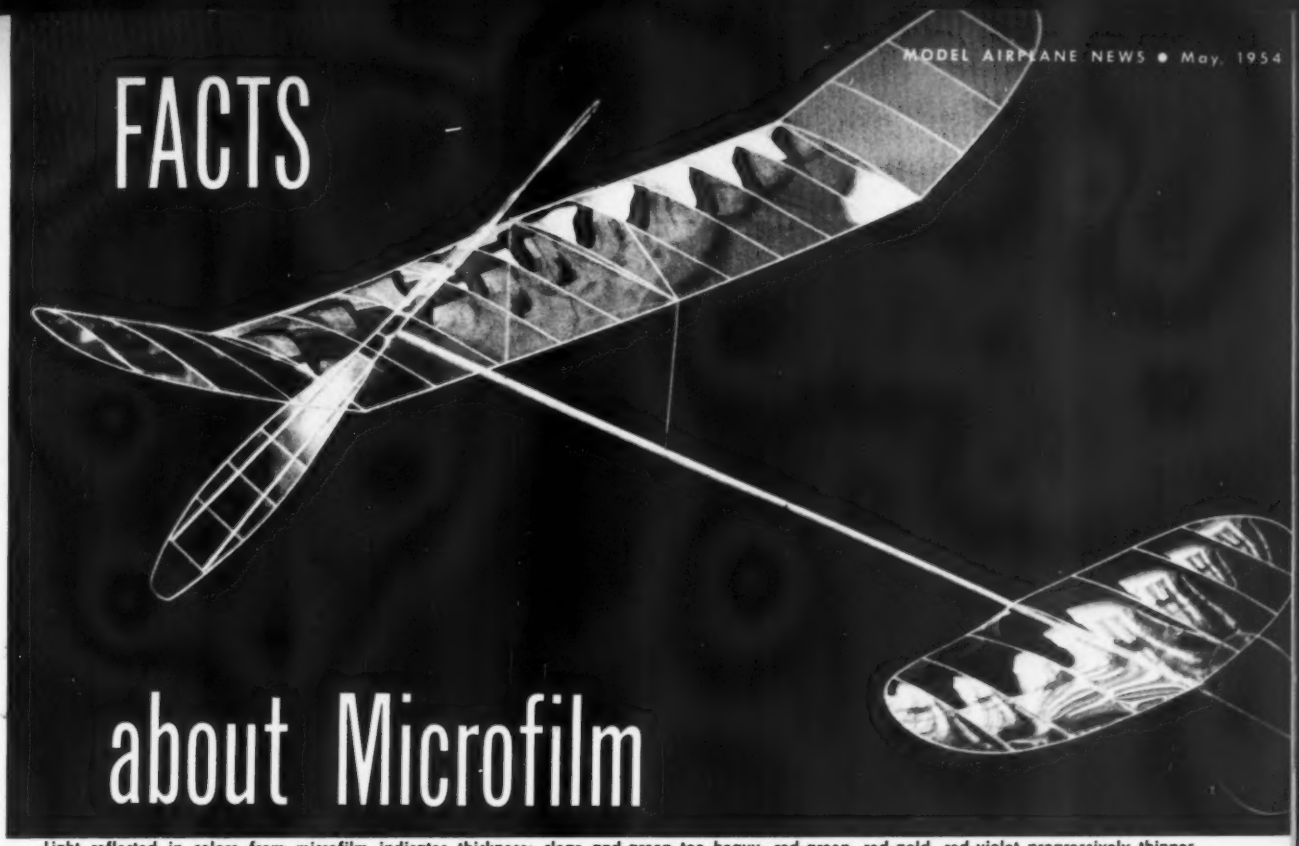
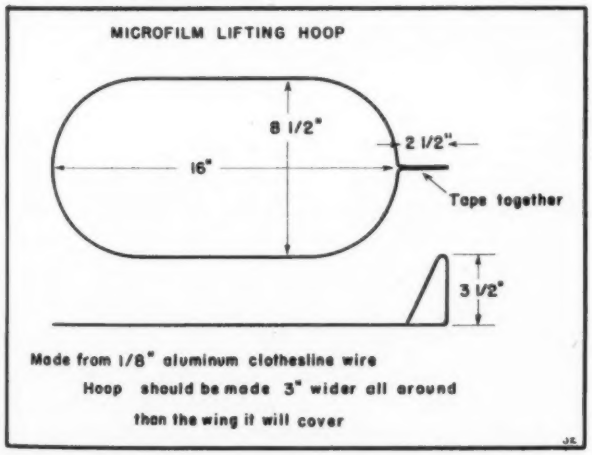
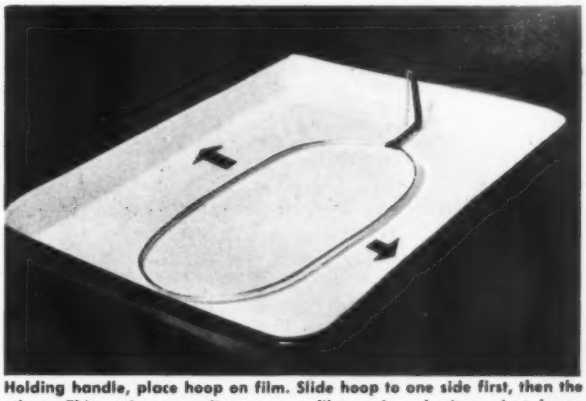


Light reflected in colors from microfilm indicates thickness: clear and green too heavy, red-green, red-gold, red-violet progressively thinner.

Ninety-nine out of one hundred modelers do not know how to make microfilm. Nine out of ten never heard of it. Now we have no excuse to avoid a slow-motion model!

by JOHN ZAIC





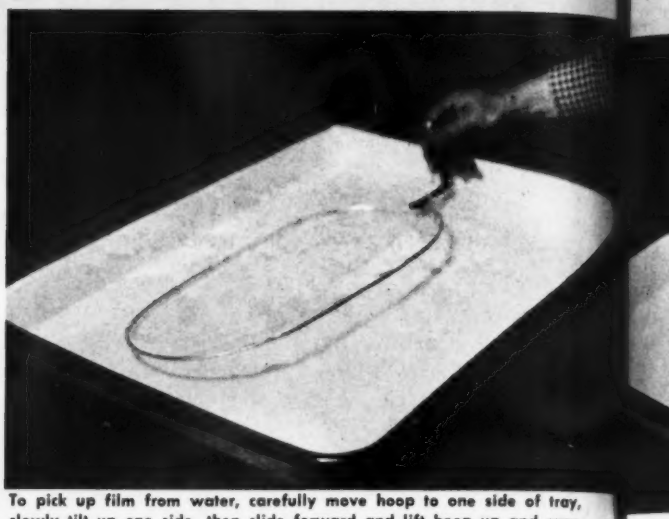
Holding handle, place hoop on film. Slide hoop to one side first, then the others. This action accordians excess film and packs it against hoop.

Below—Use bottle cap to pour solution on water. Start at one end, rapidly pour solution down middle to other. Less solution for thinner film.

▶ The wonder indoor model covering material, rainbow colored and gossamer thin—microfilm—was discovered and introduced to us by Bob Clary and his friend, Jerome Kittel, around 1930. It was the most important contribution ever made to indoor model construction and it has made present records possible.

Microfilm is so thin that light reflected from its surface is colored just like that reflected from oil rings in the water. The thickness is believed to be one ten-thousandths of an inch. Its weight is approximately .003 oz. per 100 sq. in. The film is made of a pyroxlin mixture that is poured on water. A plastic sheet is formed on the surface and is picked up with a wire hoop. The model structure is then covered with the film.

Using wet finger, push the rest of the surplus film against wire, then loop surplus film over wire in order to hold it to hoop for lifting.



To pick up film from water, carefully move hoop to one side of tray, slowly tilt up one side, then slide forward and lift hoop up and over.

Wings, stabs: cement strip wood to suitable surface. Place adhesive on frame. Wet bench (dark circle). Press hoop against strip, lay down on frame. Press film to frame with dry finger, but do not press to ribs.

For extra light frameworks, adhesive sometimes applied after film put on. Aluminum tube, about 1/32 in. inside diameter, dipped in adhesive, placed back edge wing spar, piercing film. Liquid flows along spar.

If practice facilities were available, Pete Andrews, the present world indoor record holder of 32 minutes-plus, believes the record today would be near 40 minutes!

And now for a bit of fantasy in regard to a 60 minute indoor model. There is a rumor that air foam plastics have been made so light that they float in air. The foaming agents give off hydrogen gas which is trapped in thousands of plastic cells. The gas probably diffuses in time.

Another interesting thought is an old one. Remember how you laugh when someone suggests that you fill the wings and fuselage with gas, like a Zeppelin, to make the model lighter so it will fly better? Brother, if you are an indoor builder, don't laugh too quickly. Microfilm is quite dense as a membrane. Compare the weights of a rubber balloon and an indoor model. Note the weight of hydrogen in comparison wtih air. Remember, indoor contest rules permit 300 sq. in. of wing area.

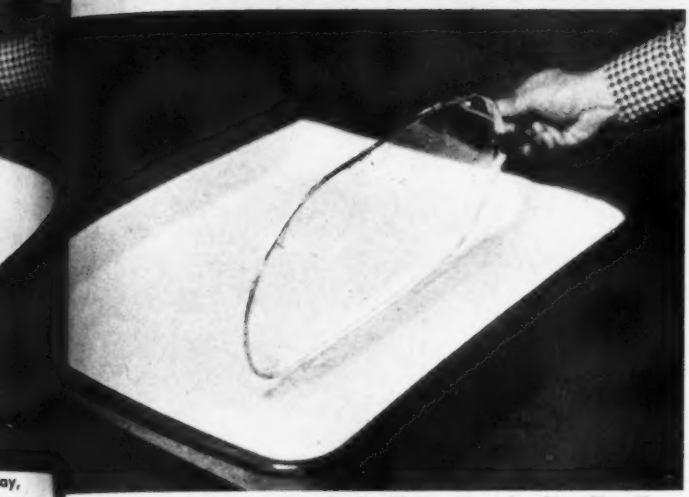
The author made a 6-in. cube with edges of 1/32 in. square balsa and covered it with microfilm. The air inside was displaced with hydrogen. The cube, when released, hit the ceiling. In other words, a double surfaced indoor wing with the air inside displaced with hydrogen may lift its own weight, but the other components would make the model a heavier-than-air craft. The total weight would be less than that of a standard model. Gas diffusion would be the main problem. I think it is an interesting idea.

It is not easy to buy a prepared microfilm solution. Jasco has a special contest solution, used by Pete Andrews, that sells for $2.50 a pint. Preparing a microfilm formula is a tricky affair and there are hundreds of formulas. An excellent beginner's mixture consists of the following:

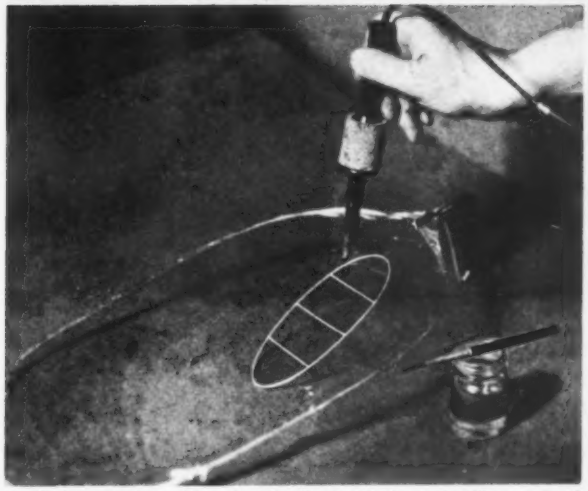
To 1 oz. of duPont Duco Lacquer 1907 (Clear), add eight drops of castor oil. Mix well and allow to settle a while before using. The lacquer is bought from dealers who stock duPont automobile lacquers. You may try using more or less oil, or no oil at all, until you get a type of film that you like. Olive oil may also be used. The experts use Tri Cresyl Phosphate and that may be ordered through the drugstore.

Film made without oil may split easily and is difficult to pick up from the water. Oil will make the film slightly elastic, so that if it is touched accidentally it will bend in a bit instead of splitting instantly. At most a small hole will be made that can be patched. Tri Cresyl Phosphate is preferred to castor oil because it will make a film flexible with almost no tackiness that collects dust. It is better to use too little oil than too much.

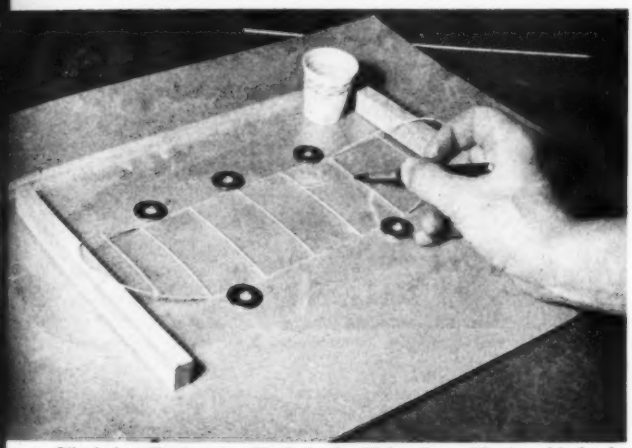
The consistency of the lacquer is very important. A too thin mixture, when poured on the water, will spread star-fashion in all directions and will not form a sheet. A too heavy mixture will spread out only a short distance and then stop. Evaporation will thicken the mixture and the manufacturer's thinner applied to reduce it.



Position of hoop as it is finally lifted without breaking film. If you can lift red-violet film without breakage, you're expert, says author.

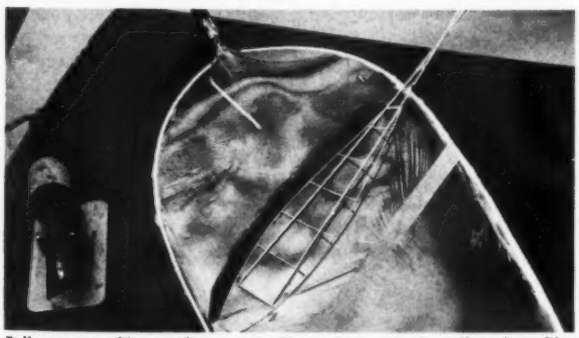


Simple frameworks moistened with adhesive, laid on microfilm, removed from hoop by hot iron or small brush moistened with thinner, acetone.

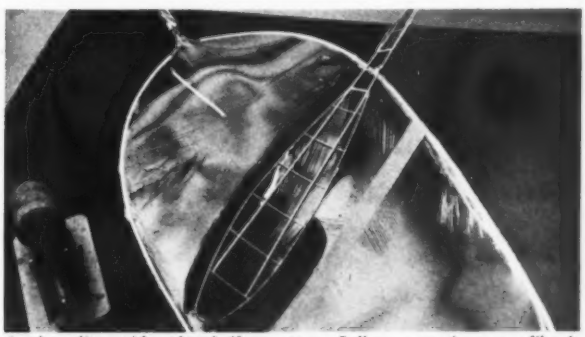


Dihedral: adhesive on dihedral rib. Nick edges, lift tips, blocks for angle, cement joints. If wrinkles, draw wet brush along dihedral rib.

Prop: apply saliva to ribs, outline. Place leading edge on film, be sure it adheres. Cut out with hot soldering iron, or acetone soaked brush.

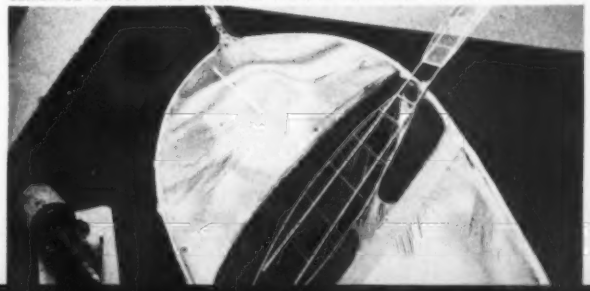


Roll prop on film, make sure trailing edge near tip adhered to film. Press film to frame with finger if necessary, cut out again with hot iron.



Apply saliva with a brush if necessary. Roll prop again, press film in place at center, trailing edge, cut out. Thus, all way around the prop.

Hub not covered. Hub rests on wire hoop throughout. Paper strip, saliva cemented across film, conserves material. Take out wrinkles with heat.



The thickness of the microfilm is determined by the color of light it reflects. Transparent clear and green are seldom used, being too heavy. Red green, red gold and red violet are the popular sheets used, with thickness diminishing rapidly. Dark violet is about the thinnest that can be used and is used for ROG's or small areas. Silver is so thin that I don't believe it has been picked up from the water. By using less solution for a given water tank, the sheets will become thinner.

A bathtub is ideal for making microfilm. Any container that can hold about a 1/2-in. of (*Continued on page* 41)

One of 1953's outstanding fliers of, and enthusiastic missionary for, the speed event, Leo shows off the airplane and some of the trophies won.

QUICK SIXTY

by LEO HOLLIDAY

For the new McCoy .60, this job is from a family of winners. The .29 version took the last Nationals. Easy, fast to build, very sturdy, steady.

The "60." In all classes, including Half-A, the Quick Sixty has top notch performance. Various fliers declare it a dream to fly. Ink sac tank.

▶ The Quick Sixty is a slick speed ship that lives up to the name. It is quick to build and fast to fly. The original airplane of this current design was built in three nights. This includes mounting the engine in the metal pan and cutting the spinner down to the correct size.

The quicky design is the product of a process of elimination of time consuming construction and the incorporation of new quick construction ideas, the result being that even the slowest builder is able to have all classes of speed ships, from the small Half-A to the large C ships. This design is named for the type of construction and not the finished profile, as in almost all cases up to now, the finished ships, built by different people, have had their own individual characteristics. Usually, the cowl shape and rudder outlines have been changed; in some cases, the wing span and area have also been altered to fit the individual's own aeronautical design or fancy.

The Class B that I won the Nationals with was the first in this line. It has been a very consistent and rugged performer. The only structural failure in two years of contest flying has been a broken elevator. On one occasion a tie-down came loose on the Quicky '29, and the ship went into the ground doing over 125 mph. The result of the mishap was a broken spinner (B & D) and the elevator hinges pulled loose.

The speed on the Quicky '29 has never dropped below 124 mph on *any flight*: top speed to date is 130.5 mph and the winning flight at the '53 Nationals was 129.44 mph.

In exactly one year's time, the two .60 ships won eight first places, one tie for first (with current open record holder, Frank Stone) two seconds and one fifth. The fifth place was won at the 1953 Nationals. Consistency is the keynote to speed and this design has it as the ship has never been flown at a speed of less than 140 mph with greatest

speed of 151.20 mph obtained in October, 1953. A brand new McCoy .60 was used. This McCoy .60 was stock with the exception that the bypass port on the case was opened up and a Dooling needle valve was used rather than the standard McCoy needle. An ink sack (or pen bladder) tank, Fairabend's Stardust "H" fuel, 9X11 Tornado prop and a Champion VG-2 plug were used. The ship did 140.5 mph on the first flight, 145 mph on the next, and 151.20 mph on the third one.

My winning Class B ship at the Nationals featured the same design and construction with only the shape of the cowling and rudder changed. Incidentally, I used a stock Dooling .29, stock 7X9 Plasticoat prop, Ohlsson racing glow plug, stock Fairabend's This-Is-It fuel, and a pen bladder tank. Winning speed was 129.44 mph. This design is adaptable to all classes in speed by reducing all surfaces proportionately. The design has been built for a Monoline A ship with very good results.

The Quick Sixty has been illustrated in this article for two reasons: one is that many fellows are eager to try the new McCoy .60 that is now available; the other reason is that a great amount of success has been achieved locally in this class by this author. The Quick Half-A (Monoline) has a Thermal Hopper for power. Two Quick .19's have been built, one with a Torp .19 (Monoline) and the other, the new Fox .19, and both have been very successful. A Dooling .29 was used in the Nats winning Quicky '29 and, of course, the Quick Sixty is powered with a McCoy.

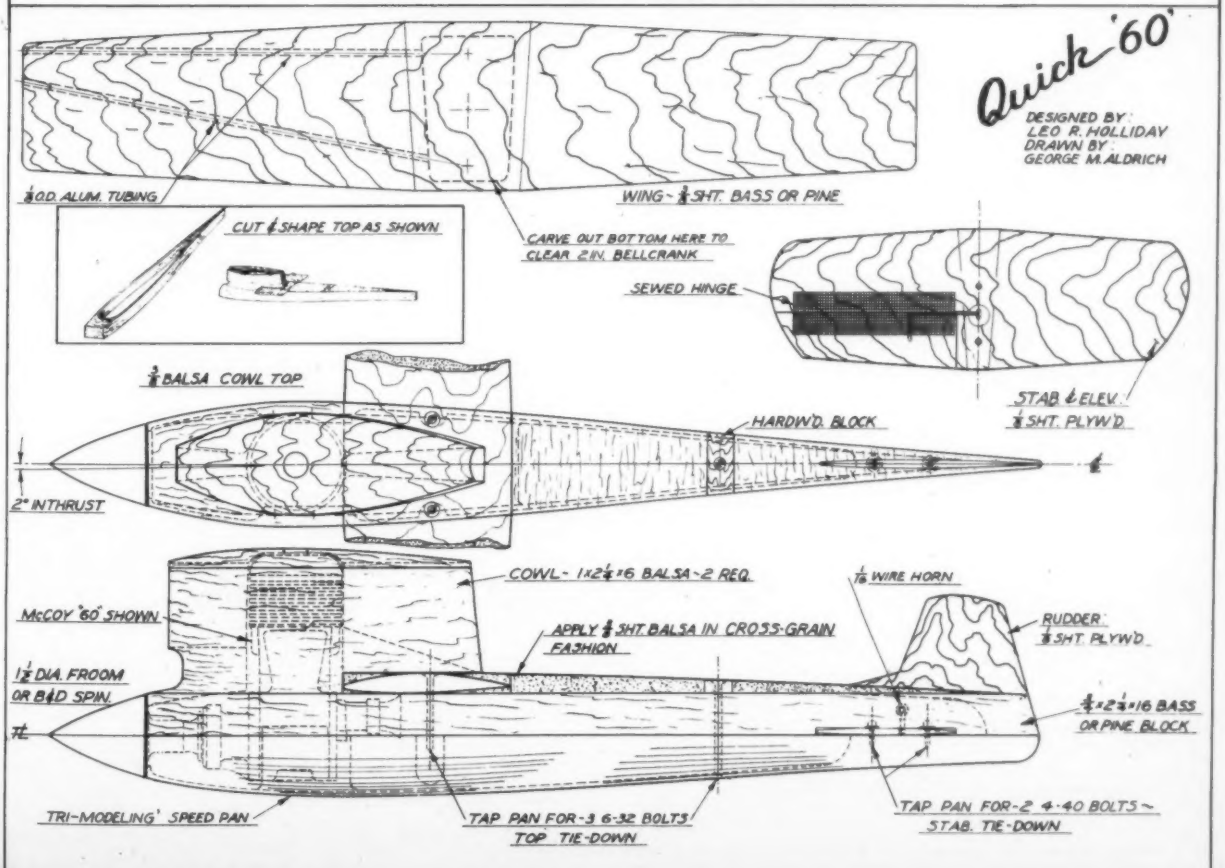
Quick Sixty's flight is very stable and is ideal for both the beginner and the expert. The ship was designed for the easiest and fastest construction possible, yet it gives a clean, consistent, and very strong airplane. This is a great factor down here in Texas where good flying fields are few and far between (in fact, pardner, even bad fields are mighty far between) and a rugged ship is a downright necessity. The competition is getting downright out of this world in all classes and Class C is no exception. There are nine or ten fellows who frequent the monthly contests in Fort Worth, Tex., who can consistently break 140 mph; four of these have turned 150 mph or better this year. I am proud to say that Quick Sixty has held its own all of the way and has finished second only twice.

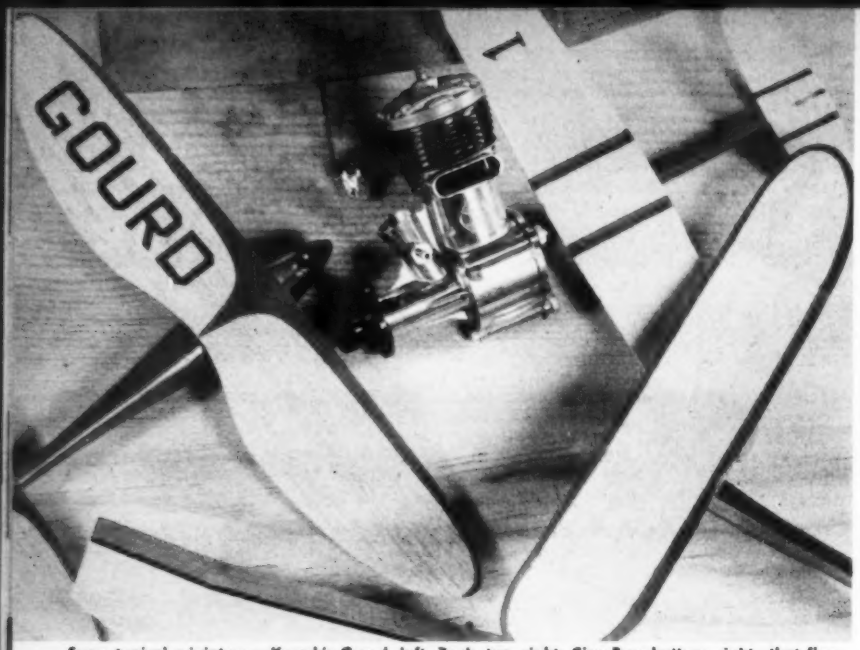
It should be made clear at this point, however, that this design or any speed design is not what makes a speed ship fast. It helps, sure, but a good well-taken-care-of engine is the real difference. A design is only the airframe to house the power plant. The airframe should be as simple in operation, construction and maintenance as possible. Fancy gadgets will lose the contest for you and quite naturally Quick Sixty has none. Quicky does have a couple of weak points as will be pointed out in the construction notes, but the strong points are in the majority.

The best starting point for this design is the metal pan. A Champion Pan produced by Jim Clem and Sam Beasly was used in all classes of this design. The real advantage is that the wing tie downs are cast into the pan. However, any pan can be used by simply making brackets for tie downs in the usual manner. For you young pattern makers, you can carve your own patterns and reduce the cost of the pan more than half.

The engine should be mounted first. The McCoy .60 has to be shaved on the bottom of the case just a little to allow it to fit in the pan. Slot the holes in a little and drill and tap mounting holes for 6/32 (*Continued on page* 49)

FULL SIZE PLANS AVAILABLE. SEE PAGE 46.


Quick '60
DESIGNED BY: LEO R. HOLLIDAY
DRAWN BY: GEORGE M. ALDRICH
1/8 O.D. ALUM. TUBING
WING - 1/8 SHT. BASS OR PINE
CUT & SHAPE TOP AS SHOWN
CARVE OUT BOTTOM HERE TO CLEAR 2 IN. BELLCRANK
SEWED HINGE
STAB & ELEV. 1/8 SHT. PLYW'D
1/8 BALSA COWL TOP
HARDW'D. BLOCK
2° IN THRUST
COWL - 1 x 2 1/4 x 6 BALSA - 2 REQ.
1/16 WIRE HORN
McCOY '60 SHOWN
APPLY 1/8 SHT. BALSA IN CROSS-GRAIN FASHION
RUDDER 1/8 SHT. PLYW'D
1 1/2 DIA. FROOM OR BLD SPIN
1/4 x 2 3/4 x 16 BASS OR PINE BLOCK
TRI-MODELING' SPEED PAN
TAP PAN FOR - 3 6-32 BOLTS TOP TIE-DOWN
TAP PAN FOR - 2 4-40 BOLTS - STAB. TIE-DOWN



Some typical miniatures—Krecek's Gourd, left; Zeek, top, right; Civy Boy, bottom, right—that flew exactly like their full size counterparts. The Torpedo .32 engine affords a comparison of sizes.

MODELS of MODELS

Dynamically similar sheet balsa miniatures of proposed designs check out ideas, reveal the hidden flaws, are invaluable aid before making, testing big ship.

by PAUL GILLIAM

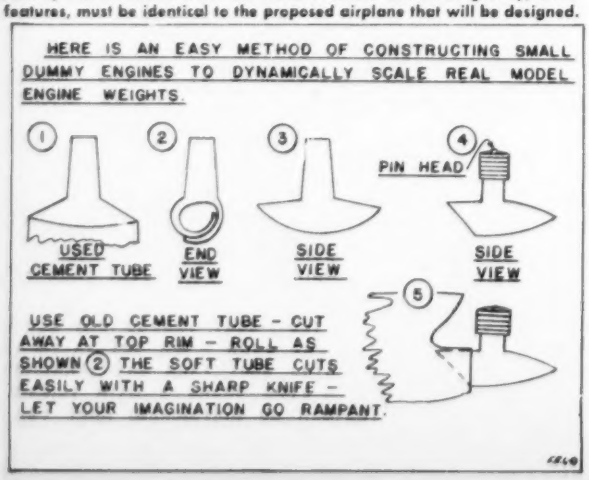
The building of dynamically similar models in small scale to test our full size gas powered models should not be received as a new idea. We rather imagine that quite a few modelers over the country have been building these 1/8 or 1/10 scale balsa models to check or correct lateral area placement, fuselage moments, and dynamic stability in general.

To the modelers who like to design or modify their own ships, this dynamically similar, or small scale sheet balsa model method, of design will be a short cut to reveal hidden faults in our design ideas. We do not mean that this small scale model method is the only sure way to design a model that has optimum performance. On the contrary, many good free flight models are designed with only basic design fact, a lark, and enthusiasm.

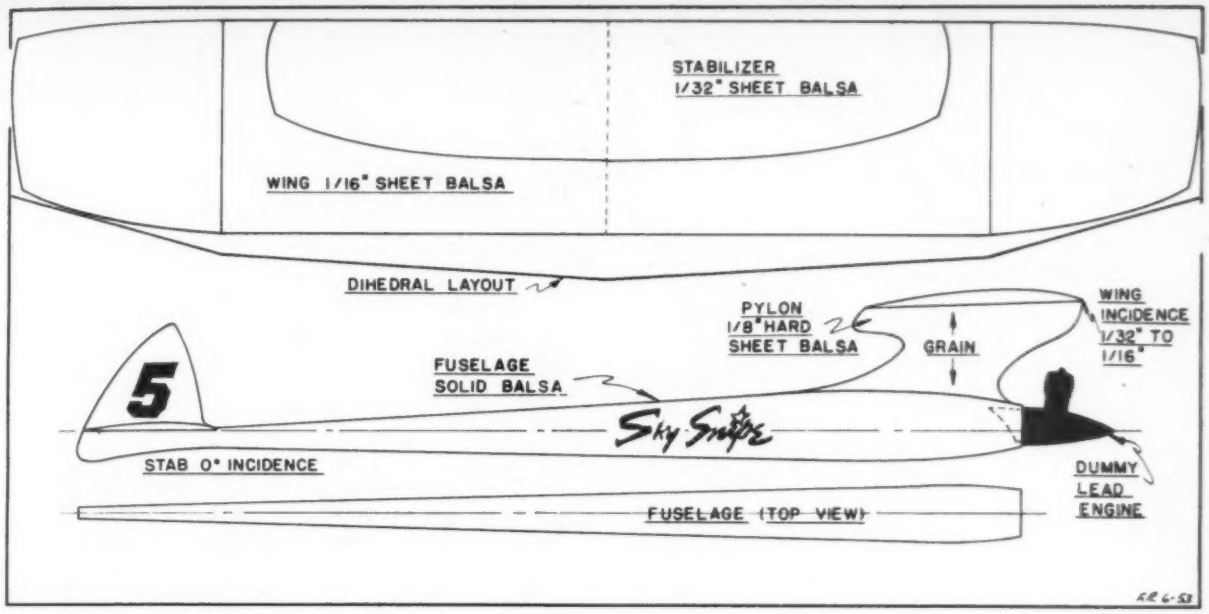
Dynamically similar small scale models can really help us with our design ideas and our brainstorms—some of which are good, some bad. When we draw the stool up to the drafting board to create a new over-powered, freeflight rocket, we can really use this dynamic similarity method of design. Small scale models (1/8-1/10 scale) will help us rule out our bad design guesses and keep the good ones. This is true if we can believe the stories these little models tell. It will take only 30 minutes or little more of a modeler's time to find out a few inherent stability facts from a miniature of our miniatures. This writer is fully convinced that dynamically similar models give a satisfactorily accurate account of stability that we seek in our bigger, powered models.

If you are ready to try this small scale method to check the abilities of its big brother, here are a few tips: 1. scale or size is unimportant: 1/5 to 1/10 scale seems normal, or try to build the small model with 7 to 9-in. wingspan; 2. do not make an effort to build the model light. Let weight be proportionate to the big ship that may follow the tests of this small one. You could well give this small model several coats of dope; 3. be certain that you use exactly the same nose and tail fuselage moments on this small model as you will on the bigger, powered model. A ballast of lead or cement tube will be needed to simulate engine weight. This weight can be a blob of lead, or a neat, small, dummy engine can be quickly fabricated from an exhausted cement tube, (illustrated). Naturally, this small model must have same C G location as the big model; 4. the addition of landing gear on these small models has so far proved little, but if you desire

Dummy motors made from old cement tubes. Center of gravity, other features, must be identical to the proposed airplane that will be designed.


HERE IS AN EASY METHOD OF CONSTRUCTING SMALL DUMMY ENGINES TO DYNAMICALLY SCALE REAL MODEL ENGINE WEIGHTS
1
2
3
4
PIN HEAD
USED CEMENT TUBE
END VIEW
SIDE VIEW
SIDE VIEW
5
USE OLD CEMENT TUBE - CUT AWAY AT TOP RIM - ROLL AS SHOWN (2) THE SOFT TUBE CUTS EASILY WITH A SHARP KNIFE - LET YOUR IMAGINATION GO RAMPANT.

This really is a mini-Hogan! Thrown into bad turns, these gliders show recovery characteristics of design. Wings made of 1/32 in. sheet balsa.



Full size plan for a mythical free flight. Whittle the fuselage, cut out the flying surfaces, assemble, and you're set for work or fun.

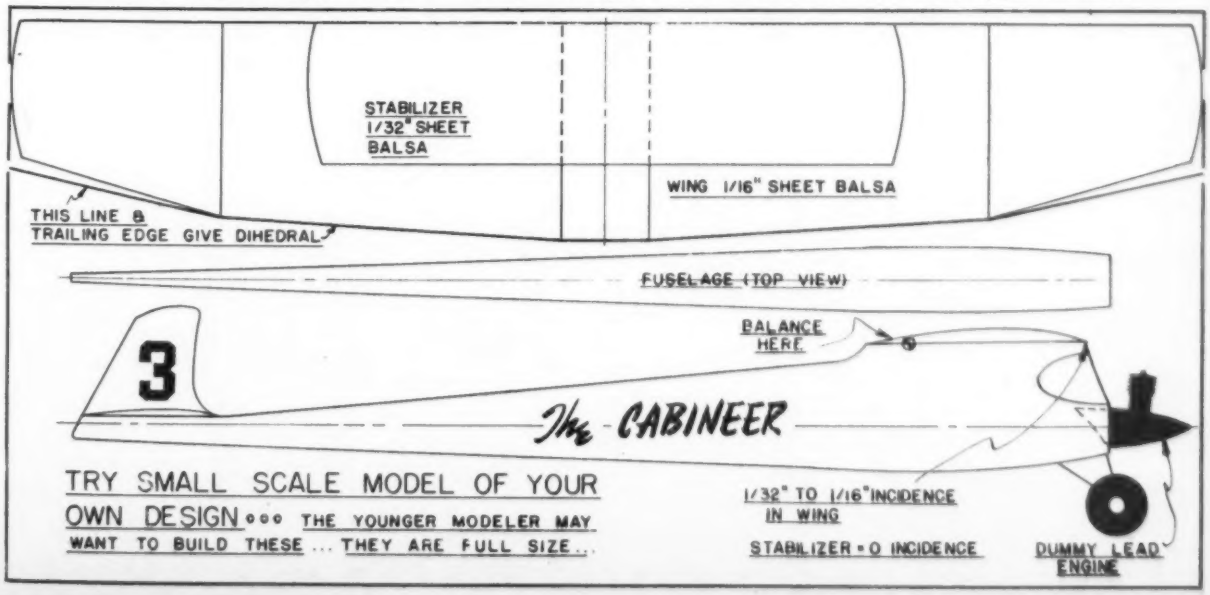
to create a small landing gear, you will naturally have a better parallel. Also, in some design cases, a landing gear with faired struts or large wheels can affect the lateral area of a model; 5. materials to use: 1/32 sheet balsa seems best for wing, stabilizer and vertical fin. These parts may be sanded to a basic airfoil shape, and in cases where you feel unsure about wing and stab airfoil combination, small (similar to the big model) airfoils can be made from 1/16 or 3/32 sheet balsa stock; 6. as a résumé: be certain you are reasonably accurate to scale in total model weight, dummy engine ballast, wing area, stabilizer area, fin area, wing dihedral, nose or forward fuselage moment, tail or rear fuselage moment, center of gravity location, decalage.

Here is a list of visible flight characteristics that can be noted by experimenting with these dynamically similar models: 1. lateral area placement; 2. vertical fin area characteristics; 3. yaw and roll stability; 4. spiral stability; 5. stall recovery; 6. glide pattern; 7. sensitivity to adjustment.

There are three definite forces that affect our full size models that we cannot show by dynamic similarity. These are torque, gyro-precision, de-stabilizing or upward resultant force of propeller spinning on the nose of the model. Other than these three forces, dynamically similar models tell an interesting story about our free flight models, and most of the other forces that we must encounter to master a free flight design.

With only 30 minutes' building time, a dynamically similar or small scale miniature will reveal a multitude of free flight problems. These small models can be launched with the force of our arm (which at peak velocity is probably near 45 mph) as we would heave an endurance hand-launched glider. But unlike the manner in which we launch this endurance glider, we can deliberately force these small dynamically similar models into a bad turn. After (*Continued on page* 48)

Is a cabin job as good as a pylon? How do these two gliders compare? Doesn't take long to find out; why not try your own ideas?



FULL SIZE PLANS AVAILABLE. SEE PAGE 46.

by H. A. WILLIAMSON

More apparent features include the lowest possible thrust line for this type design, and trike gear—all wheels "retract" for water operation.

SHOEHORN

This is the time of year when fancy turns to hydro flying. And with a classy boat like this Half-A to try, season gets started with a splash. It's amphibious.

▸ Evidence of the growing popularity of hydro flying was established this year with the inception of several all ROW contests, that included Payload, radio control and flying scale events, all run on the briny deep. Speedy runabouts replaced the old familiar "chase cars."

One of the contributing factors in the sudden interest in ROW models is, undoubtedly, the almost depleted source of suitable land flying sites, particularly along the East Coast. Another factor, perhaps, may be the desire on the part of many modelers to get away from the "cut and dried" classes and try some new and relatively unexplored fields. Admittedly, there has always been a fair amount of interest in the free flight ROW events, particularly at the Nationals. Unfortunately, these models have seldom, if ever, in recent years, reflected any especially noteworthy hydro design. In the main, they were, and are, tried and proven pylon type ROG models quickly converted to this new medium by the addition of several small floats. This is not to say that the ROW contestants don't know what the score is: they certainly do! The models are designed to give maximum performance under the existing AMA rules and those guys who have the courage to fly a red-hot pylon job off the wet handkerchief that passes as a tank get my nomination for the Croix de Guerre!

Flying a free flight model off the water for sport is the particular phase we are interested in, since it alone offers the opportunity to try something (*Continued on page* 50)

Low engine mounting and fairly wide hull enables ship to get off water without help of troublesome sponsoons or tip floats. Weight is 8 ounces.

Classy little wagon, we'd say! Hull is given three coats dope, covered, then three top coats—also three coats inside cabin. Green and yellow.

Jim Walker's big yellow colored multi-control job climbing after launch at the Dallas Nationals.

RC the "C" pays off!

Designs and radio equipment are now more dependable than a model builder! To minimize the human factor, the radio job must be treated like full size aircraft, systematized inspections, maintenance.

Now that proved airplane designs and radio equipment are widely available, it should be possible to fly an RC job the way you would fly a controlline model, flight after flight, all afternoon. But, as active fliers know, this is more easily said than done. There are so many little things that can go wrong. If we concentrated on reliability as much as we do on fussing with electronics, flying would improve immeasurably.

When you begin to fly RC, an evidence of control in the air is a terrific thrill and even a poor flight is a satisfaction. But then, as you gain experience, you become annoyed with the inevitable occasional losses of control. Stick with it and you'll realize eventually that an RC job has to be treated and maintained like a real airplane. This means more than occasional reading of voltages and checking batteries, or more than casual inspections. It means a constant over-all effort to eliminate the causes of failure. When you can convert experience into foresight, you almost have it made.

Escapements, for example, are a prime source of trouble. The common mistake is to take for granted these ingenious, hard working little devices. Although escapements are adjusted at the factory, an occasional one, any make, may require readjustment before installation in the airplane.

Rig the escapement with rubber on the bench. Arrange a "pot" to reduce the voltage to establish at what minimum voltage the device will operate with full turns on the size rubber you intend using. A good three-volt escapement will operate in the neighborhood of two volts: one make will pull in with 3/16 rubber at 1-1/2 volts. If your new escapement won't pull in at, say, 2-3/4 volts, it certainly needs adjustment before flying.

Leads from batteries to an escapement in the rear of the airplane may drop the voltage one to three tenths volt along the line, so that a control loss can actually result with nearly fresh batteries. Particles of paint or metallic finishing may have altered important clearances. Examine the mechanism, being sure that the revolving arm doesn't touch the pawl when it should clear, etc. Use a magnifying glass to examine for burrs the flat portion of the revolving arm that strikes the pawl. A tiny burr may form on the first few flights. A typical result is a loss of control when the engine cuts out, removing the helpful effects of vibration. The ideal installation would be on a slide that permits a weekly pre-flight inspection.

One questionable solution to an escapement that does not pull in properly is the simple expedient of increasing the voltage. Battery drain increases along with voltage, when the resistance remains the same, so the greater voltage usually means shorter battery life. It is also apt to magnetize the escapement parts, particularly when actively blipped, so that sticking results. The usual conclusion is that the escapement was no good. A three-volt escapement never needs higher voltage, nor does a 4-1/2 volt job require 6; if it does, the escapement is out of wack.

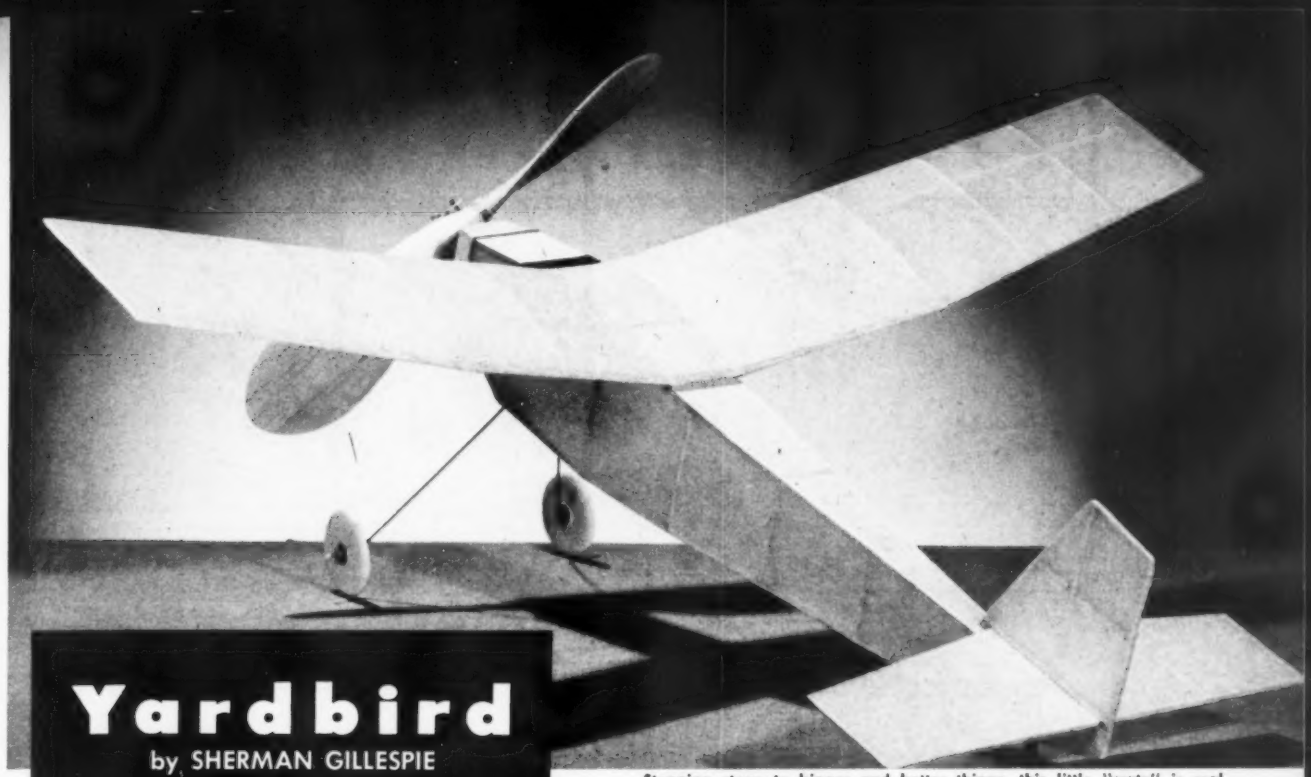
Closely identified with the escapement, and a contributing source of trouble, is the linkage, which moves the control surface. A wire yoke should always leave adequate clearance for a drive pin when the control is in a full position. The effective opening in the yoke is reduced when the control is hard over, and the pin may bind, causing a spin-in. A rusted, dirty linkage is to be guarded against.

Music wire linkage shafts that run through brass tubing or grommets for bushings require a slightly loose fit. If the wire rusts it can set up enough resistance to the escapement to make it skip. Long, heavy yokes at the ends may vibrate sufficiently with a rough motor to cause malfunctioning of the escape-

(*Continued on page* 44)

Yardbird

by SHERMAN GILLESPIE



Stepping stone to bigger and better things, this little "crate" is real altitude hound, nevertheless. Good practice on that tissue covering, too.

Designed for schoolyard pleasure flying, this little rubber powered model is exceptionally easy and cheap to build, and it is a whiz at flying.

The Yardbird is a simple model designed for your schoolyard pleasure flying. With its low cost and short construction time it will prove a breather from the big jobs. Don't let its small size fool you. This little crate is a real altitude hound!

Tests in cool air gave many flights of from 45 to 55 seconds hand-wound with top time to date a fine 1 minute 5 seconds. Warm air conditions should give some spectacular flights.

Construction is quite easy but work carefully to keep the weight of the model down. The finished ship should weigh approximately 1/2 oz. ready to fly.

Select straight grained, medium hard 1/16 in. square balsa for the fuselage. Build the two fuselage sides separately. Assemble the sides over the top view striving for square construction which is essential for accurate alinement of the wings and tail surfaces.

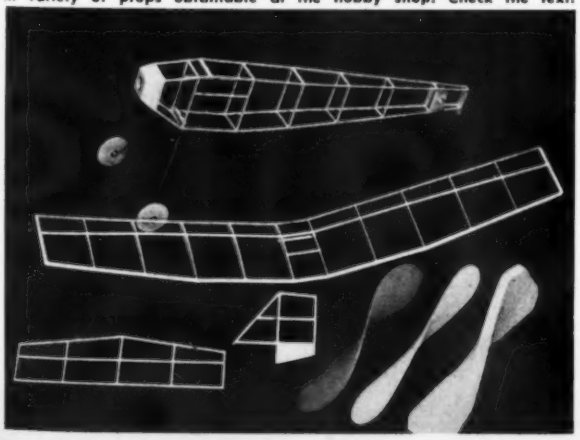
Cut the nose block from medium soft scrap balsa and drill it to receive the removable thrust button. The button shown was turned from maple but the plastic or wooden ones available at the hobby shops will work very well. Cement the completed nose block in place and give it a coat of sanding sealer.

Form the landing gear from 1/32 in. diameter wire and cement securely in place.

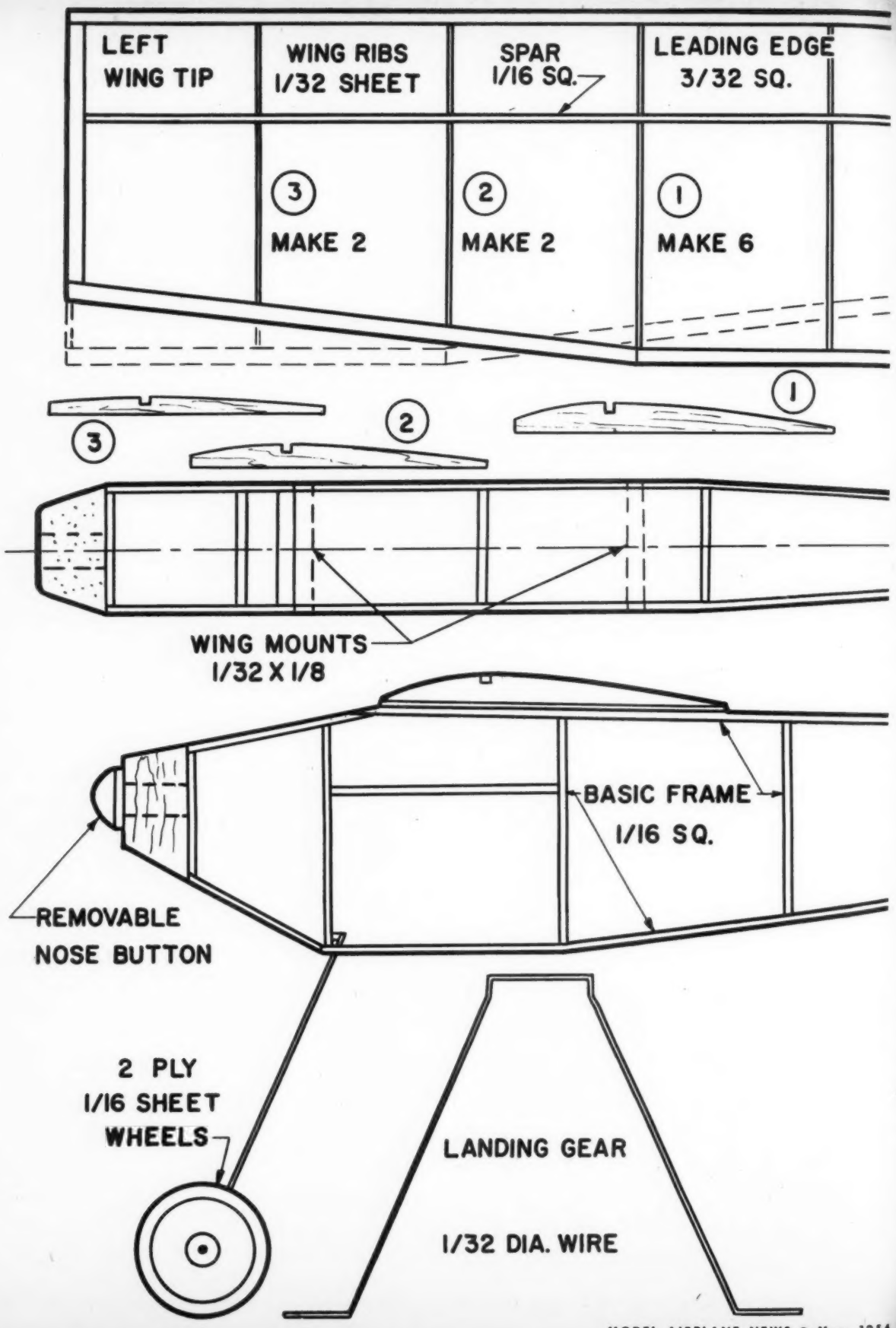
Trim away any excess cement at the fuselage joints and sand the entire structure lightly. Give the framework a coat of clear dope to seal the wood (*Continued on page* 47)

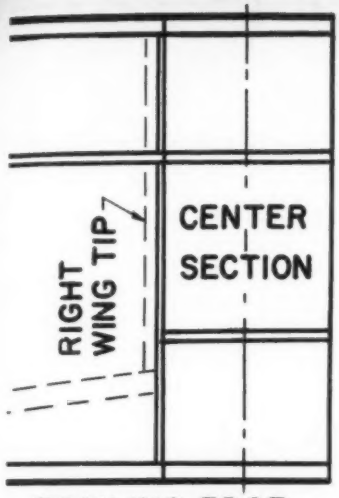
PLANS FOR YARDBIRD ON FOLLOWING TWO PAGES

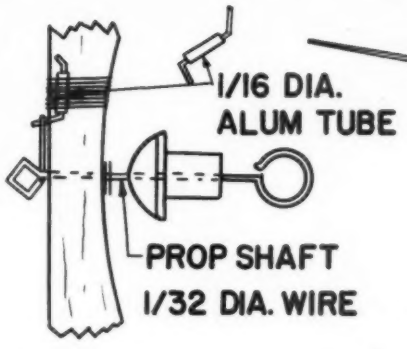
Younger subscribers yet to build that first flying model will be interested in variety of props obtainable at the hobby shop. Check the text.



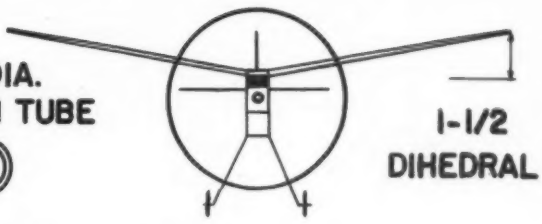
Finished prop in this picture was made from the 7-inch blank, right, in the picture at left. Free wheeling device added, described in the copy.


LEFT
WING TIP
WING RIBS
1/32 SHEET
SPAR
1/16 SQ.
LEADING EDGE
3/32 SQ.
3
MAKE 2
2
MAKE 2
1
MAKE 6
1
3
2
WING MOUNTS
1/32 X 1/8
BASIC FRAME
1/16 SQ.
REMOVABLE
NOSE BUTTON
2 PLY
1/16 SHEET
WHEELS
LANDING GEAR
1/32 DIA. WIRE

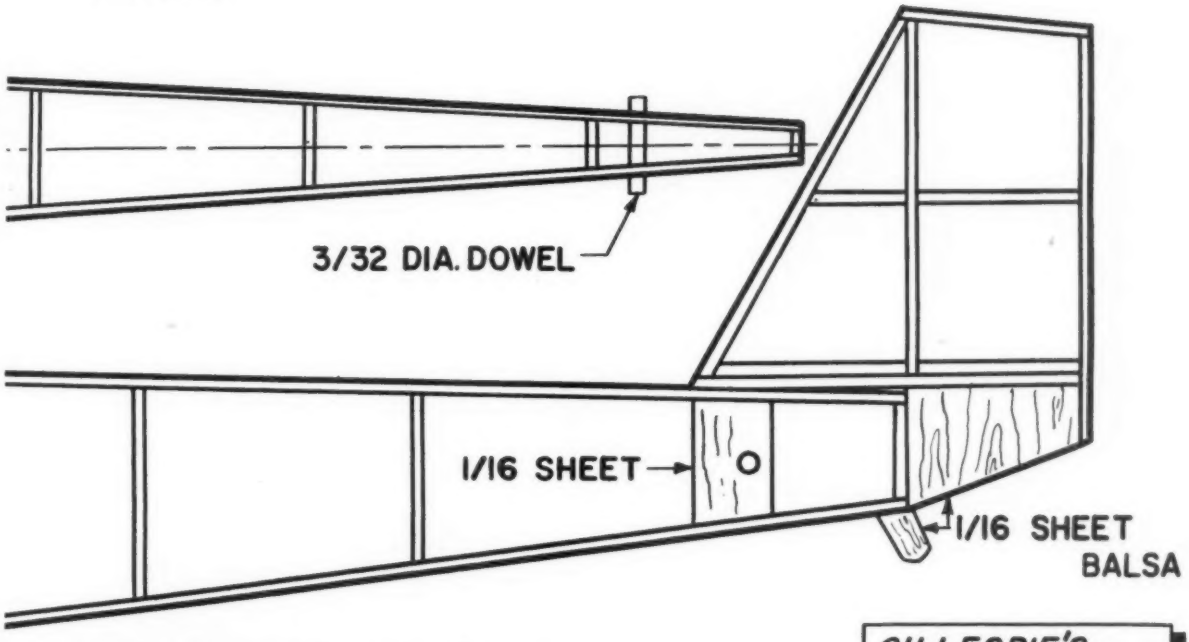




FREE WHEELING UNIT

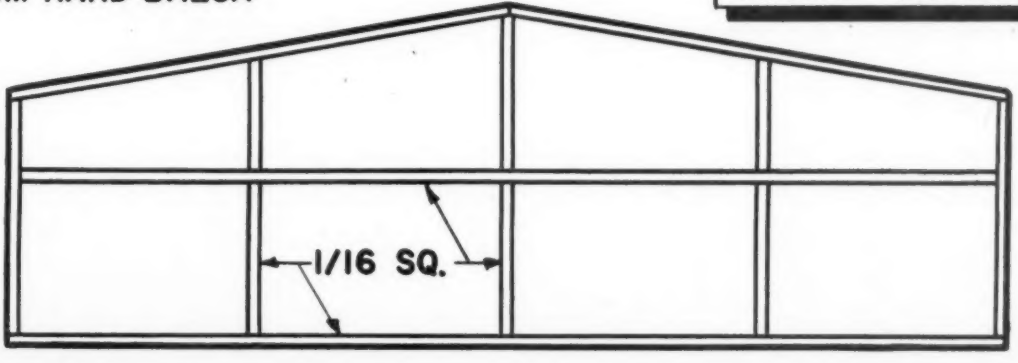


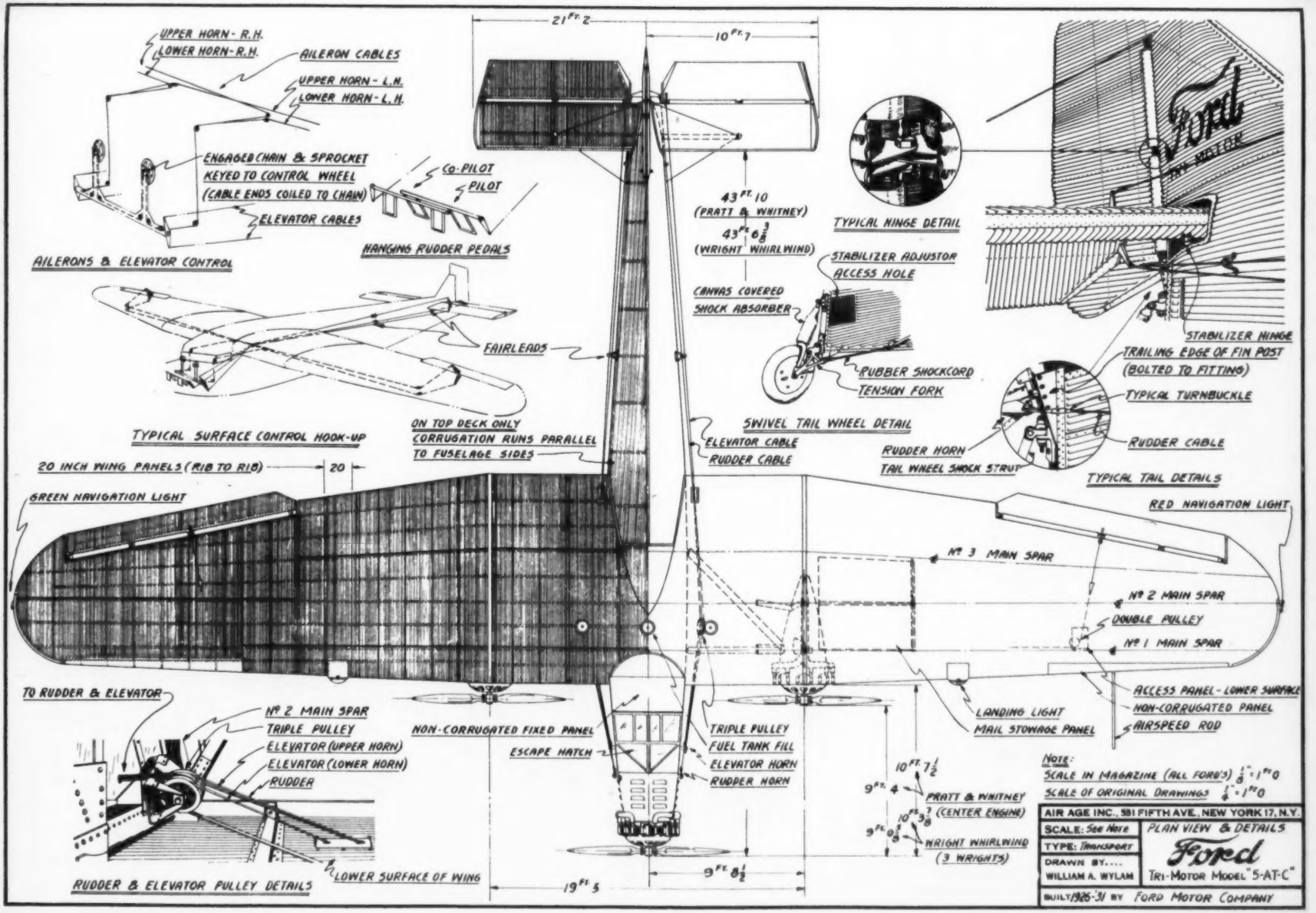
FRONT VIEW
NOT TO SCALE

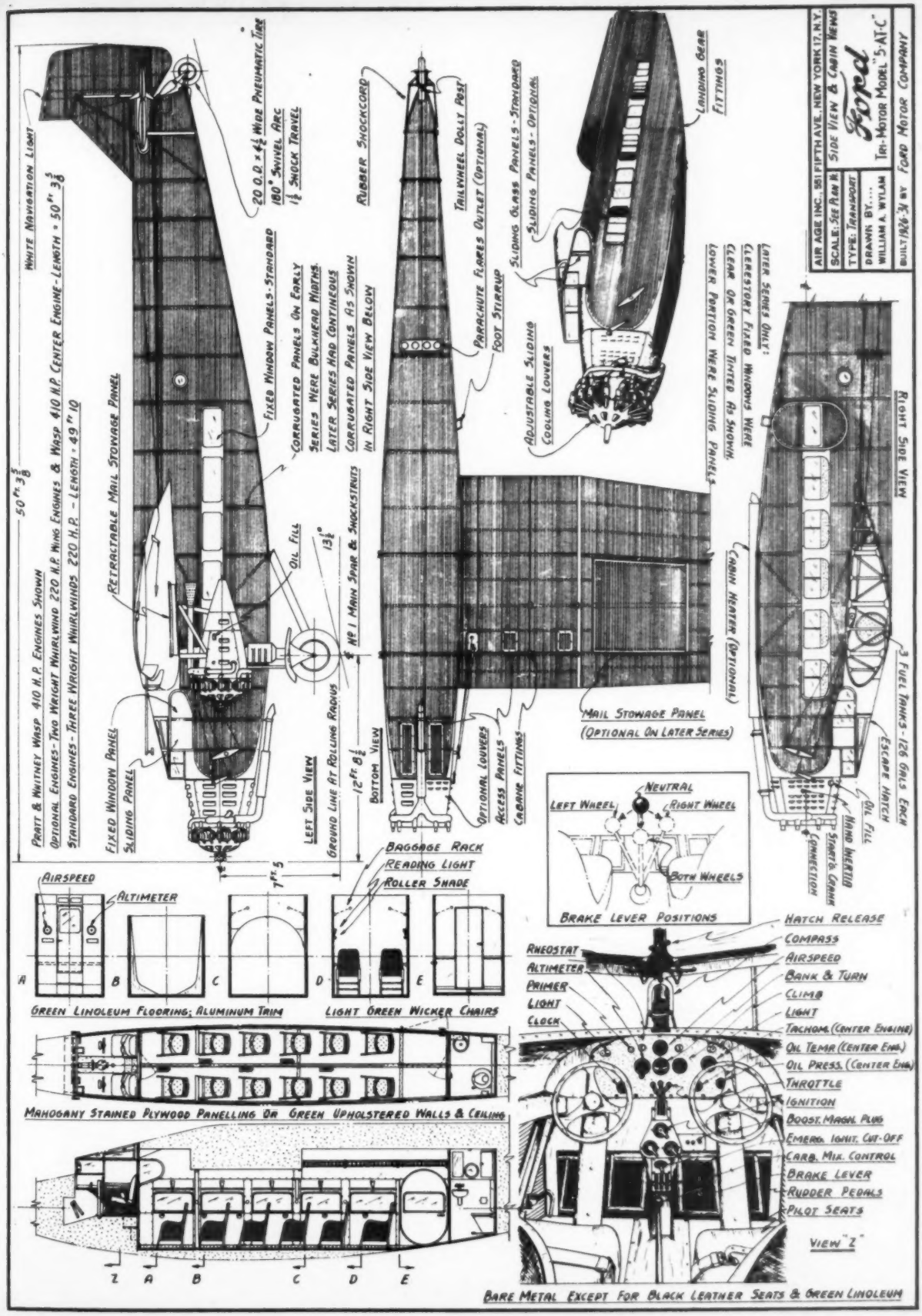


FUSELAGE & TAIL SURFACES
MEDIUM HARD BALSA

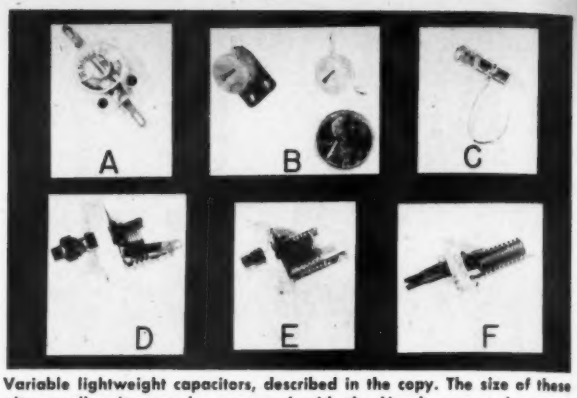
GILLESPIE'S
YARD BIRD




UPPER HORN - R.H.
LOWER HORN - R.H.
AILERON CABLES
UPPER HORN - L.H.
LOWER HORN - L.H.
ENGAGED CHAIN & SPROCKET
KEYED TO CONTROL WHEEL
(CABLE ENDS COILED TO CHAIN)
ELEVATOR CABLES
CO-PILOT
PILOT
HANGING RUDDER PEDALS
AILERONS & ELEVATOR CONTROL
FAIRLEADS
TYPICAL SURFACE CONTROL HOOK-UP
ON TOP DECK ONLY
CORRUGATION RUNS PARALLEL
TO FUSELAGE SIDES
20 INCH WING PANELS (RIB TO RIB)
20
GREEN NAVIGATION LIGHT
TO RUDDER & ELEVATOR
Nº 2 MAIN SPAR
TRIPLE PULLEY
ELEVATOR (UPPER HORN)
ELEVATOR (LOWER HORN)
RUDDER
LOWER SURFACE OF WING
RUDDER & ELEVATOR PULLEY DETAILS
NON-CORRUGATED FIXED PANEL
ESCAPE HATCH
TRIPLE PULLEY
FUEL TANK FILL
ELEVATOR HORN
RUDDER HORN
21 FT. 2
10 FT. 7
43 FT. 10
(PRATT & WHITNEY)
43 FT. 6 3/8
(WRIGHT WHIRLWIND)
CANVAS COVERED
SHOCK ABSORBER
STABILIZER ADJUSTOR
ACCESS HOLE
RUBBER SHOCKCORD
TENSION FORK
SWIVEL TAIL WHEEL DETAIL
ELEVATOR CABLE
RUDDER CABLE
TYPICAL HINGE DETAIL
Ford
STABILIZER HINGE
TRAILING EDGE OF FIN POST
(BOLTED TO FITTING)
TYPICAL TURNBUCKLE
RUDDER CABLE
RUDDER HORN
TAIL WHEEL SHOCK STRUT
TYPICAL TAIL DETAILS
RED NAVIGATION LIGHT
Nº 3 MAIN SPAR
Nº 2 MAIN SPAR
DOUBLE PULLEY
Nº 1 MAIN SPAR
ACCESS PANEL - LOWER SURFACE
NON-CORRUGATED PANEL
AIRSPEED ROD
LANDING LIGHT
MAIL STOWAGE PANEL
10 FT. 7 1/2
9 FT. 4
PRATT & WHITNEY
10 FT. 3 3/8
(CENTER ENGINE)
9 FT. 0 3/8
WRIGHT WHIRLWIND
(3 WRIGHTS)
9 FT. 8 1/2
19 FT. 5
NOTE:
SCALE IN MAGAZINE (ALL FORD'S) 1/8" = 1 FT. 0
SCALE OF ORIGINAL DRAWINGS 1/4" = 1 FT. 0
AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.
SCALE: See Note
TYPE: Transport
DRAWN BY....
WILLIAM A. WYLAM
PLAN VIEW & DETAILS
Ford
TRI-MOTOR MODEL "5-AT-C"
BUILT 1926-31 BY FORD MOTOR COMPANY


AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N.Y.
SCALE: See Plan #1
TYPE: Transport
DRAWN BY.... WILLIAM A. WYLAM
Side View & Cabin Views
Ford Tri-Motor Model "5-AT-C"
BUILT 1926-'31 BY FORD MOTOR COMPANY
Pratt & Whitney Wasp 410 H.P. Engines Shown
Optional Engines - Two Wright Whirlwind 220 H.P. Wing Engines & Wasp 410 H.P. Center Engine - Length - 50ft 3⅜
Standard Engines - Three Wright Whirlwinds 220 H.P. - Length - 49ft 10
White Navigation Light
20 O.D. x 4½ Wide Pneumatic Tires
180° Swivel Arc
1⅞ Shock Travel
Rubber Shockcord
Tailwheel Dolly Post
Parachute Flares Outlet (Optional)
Foot Stirrup
Sliding Glass Panels - Starboard
Sliding Panels - Optional
Landing Gear Fittings
Adjustable Sliding Cooling Louvers
Later Series Only: Stereostory Fixed Windows Were Clear or Green Tinted As Shown
Lower Portion Were Sliding Panels
Fixed Window Panels - Starboard
Corrugated Panels On Early Series Were Bulkhead Widths
Later Series Had Continuous Corrugated Panels As Shown In Right Side View Below
Retractable Mail Stowage Panel
Oil Fill
13½°
No. 1 Main Spar & Shockstruts
Fixed Window Panel
Sliding Panel
Left Side View
Ground Line At Rolling Radius
12ft 8½
Bottom View
Optional Louvers
Access Panels
Cabane Fittings
Cabin Heater (Optional)
Mail Stowage Panel (Optional On Later Series)
Right Side View
3 Fuel Tanks - 126 Gals. Each
Escape Hatch
Oil Fill
Hand Inertia Starter Crank Connection
Neutral
Left Wheel
Right Wheel
Both Wheels
Brake Lever Positions
Baggage Rack
Reading Light
Roller Shade
Airspeed
Altimeter
A
B
C
D
E
Green Linoleum Flooring; Aluminum Trim
Light Green Wicker Chairs
Mahogany Stained Plywood Panelling Or Green Upholstered Walls & Ceiling
Z
A
B
C
D
E
Hatch Release
Compass
Airspeed
Bank & Turn
Climb
Light
Tachom. (Center Engine)
Oil Temp. (Center Eng.)
Oil Press. (Center Eng.)
Throttle
Ignition
Boost. Magn. Plug
Emerg. Ignit. Cut-Off
Carb. Mix. Control
Brake Lever
Rudder Pedals
Pilot Seats
Rheostat
Altimeter
Primer
Light
Clock
View "Z"
Bare Metal Except For Black Leather Seats & Green Linoleum

Aeronca-type Live Wire Champion, 56 in. span, 600 sq. in. area, for engines of .15 to .19 displacement. Has both elevator and rudder controls.



Variable lightweight capacitors, described in the copy. The size of these ultra-small units may be compared with the Lincoln penny, in center.

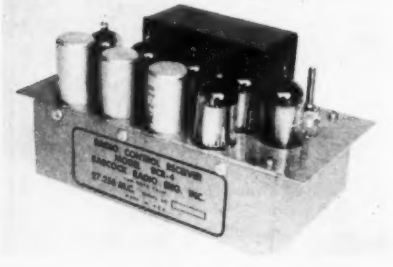
RADIO CONTROL NEWS

Printed circuits and etched wiring, new items, sub-miniature capacitors, club news, and late trends.

By E. J. LORENZ

Much awaited multi-channel Babcock X-mitter. Note control stick, the right side of the case.

Below—Six-tube receiver, three sealed relays. All controls, via compound, elevator trimmer.



▶ This is the first—and the first in print in our field, we believe—of a series of discussions and how-to-do-it chats on printed circuits, or etched wiring, as applied to model work. Just after World War II, the U.S. Signal Corp. announced a new method of "printing," or, to be more exact, etching conductor lines on an insulated base material. In the past three or four years this method of making electrical and electronic assemblies has found its way into government and commercial fields, and recently into our own field of RC work.

Basically, this is what we have: an insulated base of phenolic-paper laminate, upon which is a conductive layer of copper foil. This copper, which measures .0014 in. thick, is bonded to the base material under heat and pressure. The base may be had in thicknesses from .005 in. to 1 in. thick, although the most common sizes are 1/32, 1/16, 3/32 and 1/8 in.

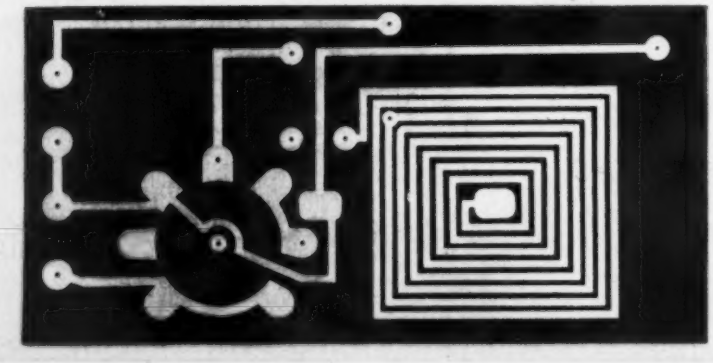
Commercially, a conductor pattern is imposed upon the copper by silk screening, stenciling or by means of what is known as photo resist. This pattern then forms a barrier, or resist, to the etching solution, which is ferric chloride. The ferric chloride solution eats away the balance of the exposed copper. The resist pattern is then removed by solvents or scrubbed off with steel wool and we have left the copper pattern such as seen in the accompanying photograph.

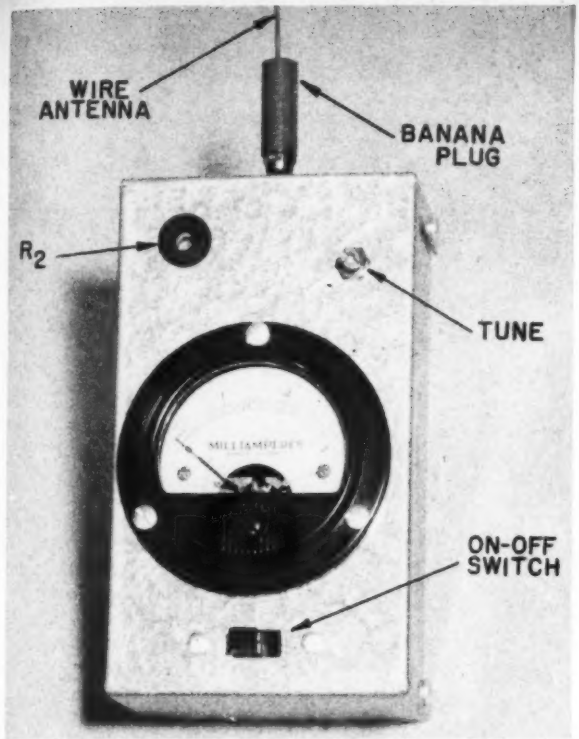
To one who has first seen such a circuit, the thought might occur that such thin copper would not be able to carry much current. However, the following figures will give you an idea of what can be expected:

Width	*Amps*
1/64	3
1/32	5
1/16	8
1/8	15

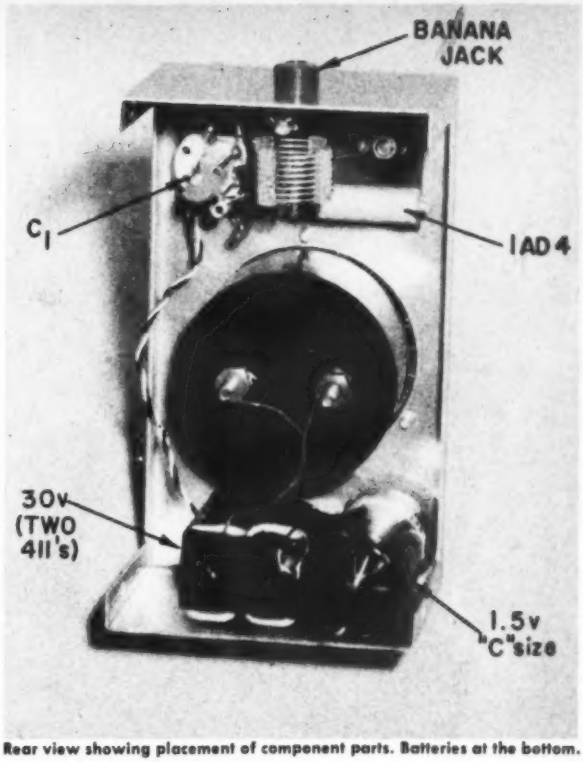
The current (*Continued on page* 41)

Examples of etched printed circuits. Although only .0014 of an in. thick, 1/64 in. wide copper strip will carry 3 amps, 1/8 in. up to 15 amps.

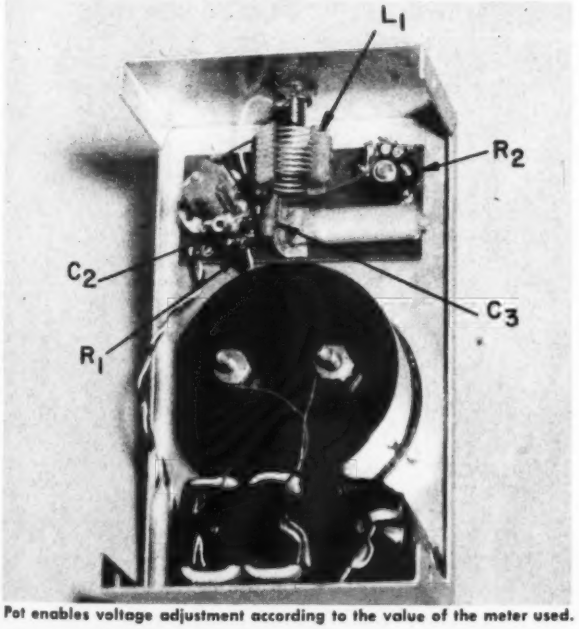




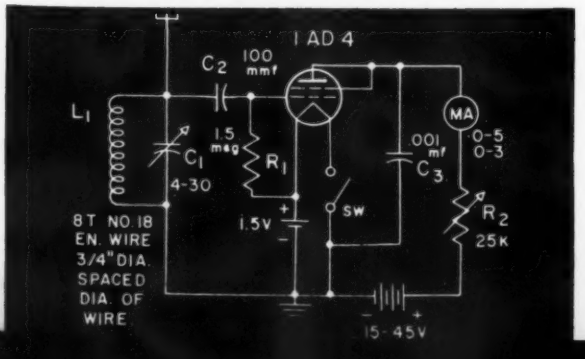
Your finished meter will look like this. Uses various available meters.



Rear view showing placement of component parts. Batteries at the bottom.



Pot enables voltage adjustment according to the value of the meter used.



SENSITIVE
FIELD STRENGTH METER

By E. J. LORENZ

Are you really sure your transmitter is putting out? Here's a simple unit for accurate checking.

▸ Range, *range,* range!

You just don't have it unless your transmitter is properly tuned and the antenna is properly loaded. We have flown excellent flights with our two-tuber using a half-watt transmitter.

In order to obtain the greatest efficiency from your transmitter, we are presenting a simple field strength meter. Perhaps you are using one which consists of a half or full wave diode circuit. This type of meter registers well at close range but has the disadvantage of low sensitivity and the need for a sensitive meter, usually 0-1 ma or less. The described field strength meter employs a sub-miniature 1AD4 RF pentode in a grid leak detector circuit, and uses a 0-3 ma meter, one that every RC modeler has on his bench.

This will not be a full-fledged construction article, for space does not permit, but the schematic diagram plus photographs should be sufficient. In addition, this circuit has been built with a variety of components, such as air trimmers and ceramic trimmers, air coils and slug-tuned coils, and tubes including the 1AD4, IAG4, CK5607, RK-61, XFG-1, CK525, and CK5677. Meters have ranged from 0-1 to 0-5. Results have been similar in all cases. Your unit may be built into almost any size case that will suit the construction; we used a 3006 mini-box.

As far as construction is concerned, keep all leads as short as possible; this is not imperative (*Continued on page* 48)

TESTORS "39" FUEL HELPS SE MODEL PLANE ENDURA OF 8 HOURS, 31 MINUT

Model Record

The mechanical-minded young and not-so-young who fly model airplanes in tethered circles have a new mark to fly at. Last week Sherman Holt, 14, of Fayetteville, N.C. kept a model plane in the air for 8 hrs. 31 min. and 50 sec., leaving his nearest competitor more than seven hours behind.

Farm Boy Holt built his first (5¢) model at the age of six. Since then he has been working toward bigger projects. A few weeks ago he had the idea of refueling his latest model through a plastic tube running up the control wire. With help from older fans, he fitted the model with an extra gas tank and rigged the plastic tube.

First trial, which was at night, lasted

Fay Ridenour

PILOT HOLT & CRAFT
From the neighbors, a counter-offensive.

for 3 hrs. 43 min., but was cut off after a counter-offensive by kept-awake neighbors. A good part of Fayetteville was on hand during Sherman's next flight. Every seven minutes or so, he pumped fresh gasoline into the tank. The flight would have lasted even longer if the extra gas tank had not vibrated loose. If the model had been flying in a straight line, it would have covered 257 air miles.

AS REPORTED IN TIME MAGAZINE

. . . Impressive evidence that TESTORS "39" is the all-purpose fuel that you can count on for really dependable performance

The article at the left — reprinted from TIME Magazine of September 28, 1953 — gives you the fascinating story of how 14-year old Sherman Holt, Fayetteville, N. C., set a new world's endurance flight record for model airplanes last fall.

For his ingenious engineering, flying ability, resourcefulness, and physical stamina, model-builders everywhere give him congratulations and well-deserved applause.

Here at Testors, we share in the pride of his achievement because he used Testors "39" Fuel — exclusively — in his record-shattering flight! Documented reports read that when the plane landed — 8 hours, 31 minutes, 50 seconds, and 16 pints of fuel after the take-off — the motor was still in good condition!

You, too, will find Testors "39" an all-purpose fuel that will give you the engine-protecting flight performance you want for any kind of stunt, contest, or just-for-fun flying! It's available in half-pints, pints, and quarts at your favorite hobby shop . . .

TESTOR CHEMICAL

E NEW WORLD'S
AE FLIGHT RECORD
TE 50 SECONDS...

(Left to r… …ne record-holder Sherman Holt, his official time-keeper from Piedmont Av… …nii Field, Fayetteville, N. C. where the flight took place, and co-pilot J. W. Cr… …isted Sherman during the long grind. (Inset above) Camera study of Sherman… …ontrol lines.

L MPANY • ROCKFORD, ILLINOIS

The designer primes the engine of his duo-mono before starting. Developed through a series of models, it is extremely stable, especially in the stalls, and is an excellent windy weather performer.

ALKIE IV

by ROLAND T. MAYER

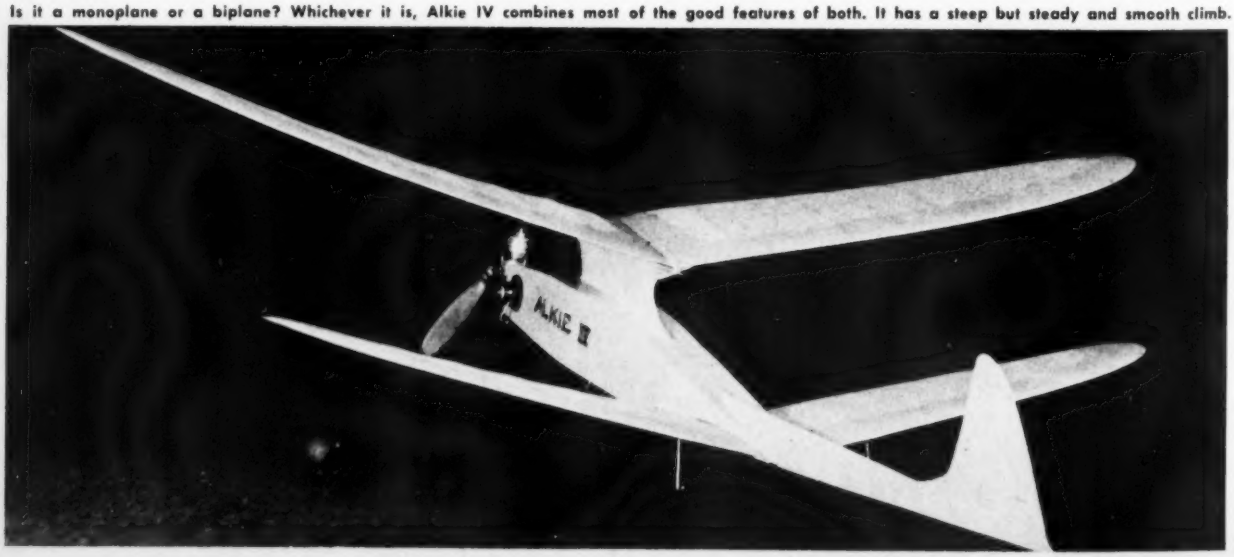
No freak, just to be different, this is a high performance ship with many special and desirable attributes. This duo-mono configuration was proved by the French Delannes—real aircraft.

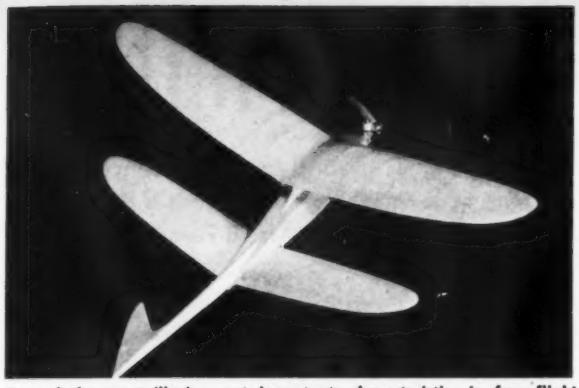
As the name implies, this is the fourth in a series of duo-mono configurations that we have had the pleasure to design and fly in the past few years. After this rather lengthy association with these little by-wingers, we will go on record as saying that for sure at least one of those fifty million Frenchmen wasn't wrong. M'sieur Delanne, who turned out several admirable duo-monos just before the roof fell in on La Belle France, really had something.

As the latest in our series, Alkie IV displays the type of performance we had hoped might eventually be attained when the number one ship was started. Like the previous models this ship has shown itself to be extremely stable, particularly with respect to stalls, and excellent for windy weather flying. Under power the climb is steep and steady with none of the eccentricities so common to many hot free flights, and because of the unique characteristics of the duo-mono configuration, the transition from climb to glide is a sight to behold.

This helpful peculiarity further accounts for an extremely stable, flat glide by virtue of its automatic compensation for

Is it a monoplane or a biplane? Whichever it is, Alkie IV combines most of the good features of both. It has a steep but steady and smooth climb.





One of the most illusive, yet important, characteristics in free flight is smooth transition from power to gliding flight. Here, Alkie excels.

Both wings—or is it wing and tail?—tie on with rubber. Since there is no stabilizer to pop up, dethermalizer must be either chute or a spool.

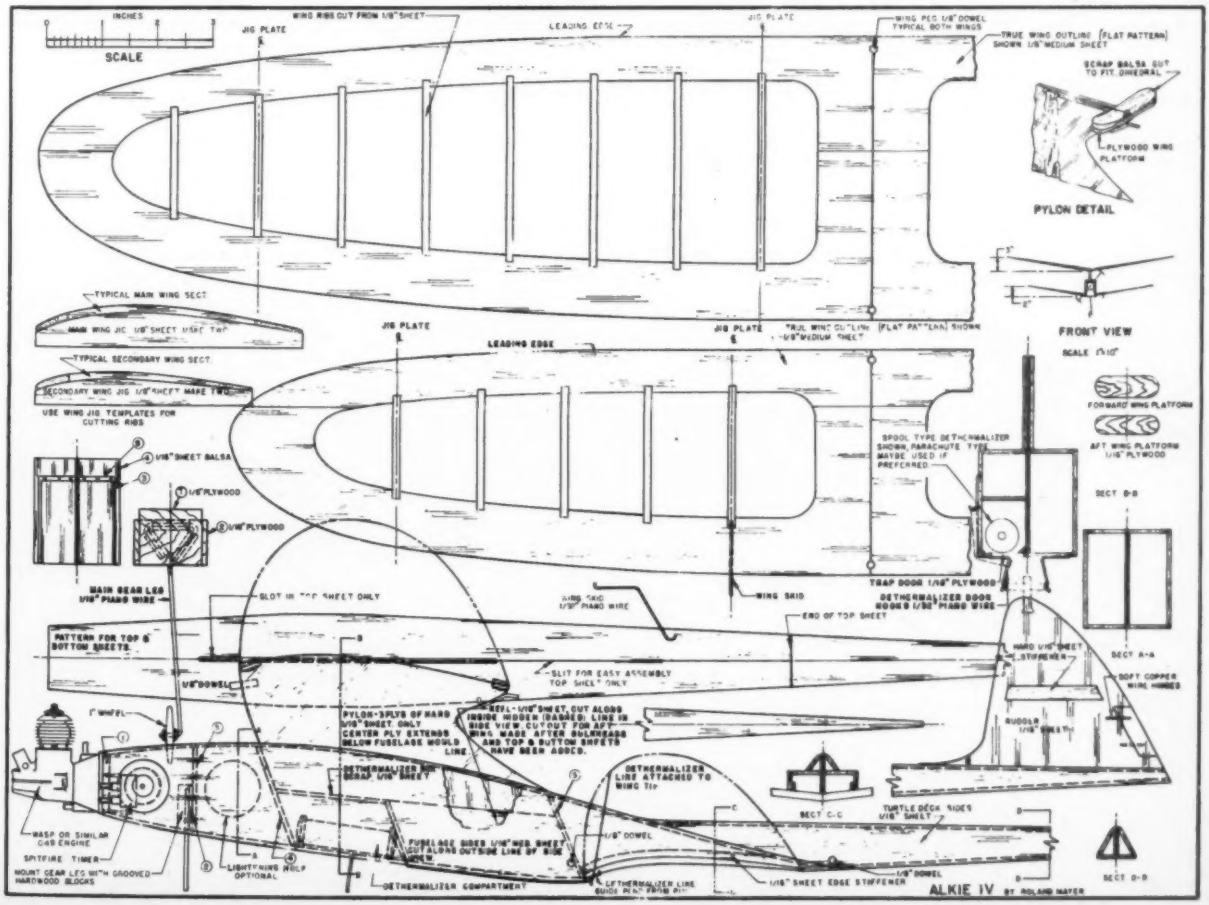
gusts and rough air in general. The gimmick boils down simply to the proper use of decalage. In the case of Alkie IV, the main wing was set at $+3°$ and the secondary wing set at -2. The idea is to have the secondary wing approach its position of maximum lift as the main wing approaches its stalling point. The resulting unbalanced pitching moment immediately acts to restore the ship to its normal flight attitude. This arrangement, simple as it may seem, accounts for the unique and pleasing characteristics of the ship.

Since the performance of a free flight model is generally proportional to its flying weight, care should be exercised during construction to keep the ship as light as possible without sacrificing structural strength. If intended for competition, Alkie IV should be held close to the 5 oz. minimum for Half A's.

The wings are of conventional Ritz type construction built on a simple jig made up of two 1/8 sheet plates cemented to the work bench at the positions indicated on the plan.

The fuselage is built around a center keel. First the center ply of the pylon is cemented in place as shown. Then all the bulkheads except number two are added. Next add the top and bottom sheets. Now cut away keel and bottom sheet, previously marked to allow passage for the secondary wing. Also cut a slot to facilitate installation of bulkhead number two and landing gear attachment. Next add the fuselage sides, turtle deck and rudder. Finally complete the fuselage and add the hardware as indicated on the plan.

Since there is no stab to pop (*Continued on page* 50)


SCALE
JIG PLATE
LEADING EDGE
WING PEG 1/8" DOWEL TYPICAL BOTH WINGS
TRUE WING OUTLINE (FLAT PATTERN) SHOWN 1/8" MEDIUM SHEET
SCRAP BALSA CUT TO FIT DIHEDRAL
PLYWOOD WING PLATFORM
PYLON DETAIL
FRONT VIEW
TYPICAL MAIN WING SECT.
TYPICAL SECONDARY WING SECT.
USE WING JIG TEMPLATES FOR CUTTING RIBS
1/16" SHEET BALSA
1/8" PLYWOOD
MAIN GEAR LEG 1/16" PIANO WIRE
SLOT IN TOP SHEET ONLY
WING SKID 1/16" PIANO WIRE
WING SKID
TRAP DOOR 1/16" PLYWOOD
DETHERMALIZER DOOR HOOKED 1/32" PIANO WIRE
END OF TOP SHEET
PATTERN FOR TOP & BOTTOM SHEETS
1/8" DOWEL
SLIT FOR EASY ASSEMBLY TOP SHEET ONLY
1" WHEEL
PYLON-3 PLYS OF HARD 1/16" SHEET. ONLY CENTER PLY EXTENDS BELOW FUSELAGE MOULD LINE
KEEL-1/16" SHEET, CUT ALONG INSIDE HIDDEN (DASHED) LINE IN SIDE VIEW. CUT OUT FOR AFT WING MADE AFTER BULKHEADS AND TOP & BOTTOM SHEETS HAVE BEEN ADDED.
DETHERMALIZER LINE ATTACHED TO WING TIP
WASP OR SIMILAR .049 ENGINE
SPITFIRE TIMER
MOUNT GEAR LEGS WITH GROOVED HARDWOOD BLOCKS
LIGHTWEIGHT HELP OPTIONAL
FUSELAGE SIDES 1/16" MED. SHEET CUT ALONG OUTSIDE LINE OF SIDE VIEW
DETHERMALIZER COMPARTMENT
1/8" DOWEL
1/8" SHEET EDGE STIFFENER
SECT C-C
TURTLE DECK SIDES 1/16" SHEET
SECT D-D
SECT A-A
SOFT COPPER WIRE HINGES
RUDDER 1/16" SHEET
FORWARD WING PLATFORM
AFT WING PLATFORM 1/16" PLYWOOD
SECT B-B
ALKIE IV BY ROLAND MAYER

FULL SIZE PLANS AVAILABLE. SEE PAGE 46.

NEW

5.95

BADGER

WING SPAN 72" CLASS A-B-C .19 TO .35 ENGINES

The easiest built freeflight on the market today, with a sky-rocket climb and perfect transition from power to a table top glide. A completely new design with phenominal airfoils.

6.95

COUGAR

WIN SPAN 54" SUPER STUNT .29 TO .35 ENGINES

Designed to meet the modelers need for simple construction, while maintaining outstanding maneuverability under all conditions. Known the world over for its dependability and superior performance.

6.95

PANTHER

WING AREA 508" STUNT SPECIAL .29 TO .35 ENGINES

Spectacular flying at its best. The most beautiful stunt model that can be bought. As nice to fly as it is to build. Your friends will envy you if you fly the PANTHER.

4.45

WILDCAT

WING SPAN 37" FULL STUNT .19 TO .35 ENGINES

The backbone of the country's stunt and sport flying. More Wildcats are sold than all other models in its class. For all around sport, fly the Wildcat and you fly the best.

radio control

10.95

BUZZER'D

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FOREIGN NOTES

Modeling progress around the world proceeds at a fire engine pace. Many new things for U.S. modelers to try rounded up in this interesting report.

by P. G. F. CHINN

Live Wire Snrs. Win Aussie Nats

The Seventh Australian Model Aircraft Championships, held December 27 through January 2 at Toowoomba, Queensland, had a full program of 24 events. As so often happens, high wind (even at 5 a.m.!) accompanied RC event and discouraged most entrants from making official flights. Winner was Don Adams, Queensland sugar-cane farmer and well known RC modeler, followed by Peter Weaver, former Queensland stunt champion. Both flew deBolt Live Wire Seniors having slight structural modifications and using rudder and engine control. Winner's model was powered by Amco BB 3.5 (.209 cu. in.) Diesel with a choke-disc throttle. Weaver used two-speed Cameron .19 with 9-1/2 x 6 plastic prop. Performance of two ships was approximately the same.

F-84 jet, Eureka kit, Japan; pic, Lt. D. Brooks, Nagoya. Metal aft section melts 1,200 degrees.

Jap Scale Jets

In Japan, it seems, they go strongly for controlline scale. Models reflect American influence inasmuch as they are mainly of U.S. military aircraft, but do not use American constructional methods because of substitution of hardwoods and aluminum for scarce balsa. In marked contrast to Western trends, too, pulse-jet powered scale jobs are not shunned by manufacturers and you can buy a kit for a Thunderjet, Shooting-Star or Sabre and power it with a Dynajet or one of the Jap copies of this engine.

To get over the heat problem with enclosed jets, the aft section of the model is simply made of aluminum. Lt. Dwight F. Brooks reports from Japan on his Jap Eureka jet powered F-84 Thunderjet, a model of the F-84 in which he flew combat in Korea. This job needs three laps to unstick and gets up to around 80 mph in the air. Landing speed is an estimated 45 mph and likely to prove tough on wheels. Ship spans 35 in., has ten coats sealer, five coats silver and two coats clear lacquer. Front section opens to give access to motor and 4-1/2 minute gas tank.

European Diesel Fuels: The Lowdown

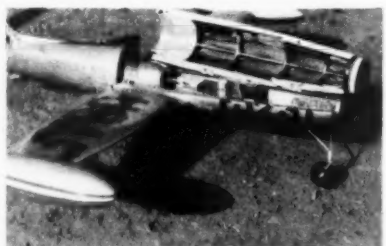
An awful lot of guff has been talked about fuels for Diesels. Some people seem to have the idea that Diesels won't perform unless one has access to some chemically complex European concoction. The fact is that Diesel mixes, as used in Europe, have not changed significantly in the past five years. About 1948 it began to be realized that the innumerable and multifarious mixtures hitherto recommended (every engine manufacturer specified a different fuel formula) were best forgotten. Any Diesel worth its salt would run satisfactorily on an equal parts mix of ether, kerosine and oil, and the same still applies today. The only really worth while improvement came with the addition of amylnitrate, and this does not add power to any appreciable extent; it merely smooths combustion and allows the motor to run on a lower compression ratio. Beginners may also find starting less critical with this additive.

Only if absolute maximum performance is being aimed at do Diesel mixes need to be modified according to the types of motors in which they are being used, in which cases we alter the proportions of the fuel constituents. Our basic formula still stands. There are no magic additives in European fuels. Lightweight, high-speed Diesels invariably run hot and need more ether to keep cool. Increase the ether content to 40 per cent or 50 per cent in such cases. To maintain highest lubricating properties, you can substitute high-speed Diesel truck oil for the kerosine if you wish and/or a castor base oil can be used in place of SAE 70. (The ether acts as a stabilizer for the vegetable and mineral base constituents.)

Good all-round formula for average modern Diesels: ether (specific gravity .720) 43 per cent, castor oil 25 per cent, Diesel fuel oil 15 per cent, kerosine 15 per cent, amylnitrate 2 per cent.

Japanese Over-Water Contest

In contrast to the 1952 contest, when two models stayed the course, none of the 27 contestants, gathered from all over Japan, managed to qualify in the second "over-water" contest held last November 29. Launched from an island, models have to reach the mainland and land close to Itoo city. Most ships had been designed for a quick climb, depending on altitude and drift to bring them down on target. This had paid off in the previous year's contest.



Eureka jet engine, 4-1/2 min. tank. Three laps to get airborne, does 80 mph; lands at 45 mph.

Unfortunately, weather conditions were entirely different this time. Reports say that a 5 mph wind was blowing in the right direction, but that between 600 and 1,000 ft., approximately, air was calm. Many models got into this doldrum belt and just dropped down in the sea a few hundred yards offshore. Nine others reached a fast-moving belt of air at

higher altitude and were carried out of sight on the far side of the city. Better luck next time, maybe.

Turbo-Gyro-Stabilizer

We have lately seen a couple of methods of achieving directional control using gyroscopic stabilizers. One of these, American in origin, used gyroscopic effect imposed by rotating airscrew. In this, engine lugs, instead of being bolted down, were pivoted on the bearers, allowing a sort of variable downthrust. Most FF men are familiar with gyroscopic precession in which deviation, left or right, results in, respectively, a climbing or diving force being imposed by the rotating mass of the prop. By pivoting the motor on its bearers and linking it to a rudder by means of a push rod, this force can, instead, be used to operate a compensating directional control.

Diesels that won't hold compression setting; fit locking lever, mild steel, tap for thread.

The second method comes from Soviet Russia. It is more involved and, we think, much less practicable for model airplane use. In this a separate gyro wheel is employed, mounted in the fuselage behind the engine. It is in the form of a simple turbine driven by exhaust gas ducted from the engine. It is pivoted laterally and is coupled to the rudder as in the American version, its action being exactly the same. Since a separate gyro is used (and this would have to be of reasonable mass to be effective) this system has the obvious disadvantage of added weight.

.15 Speed—Diesel vs. Glow

The present Torpedo held record apart, Diesel and glow plug are running pretty close in the fight for top honors in FAI Class I speed (2.5 c.c. or .151 cu. in.). Official over-100 mph figures include Pete Wright's 106.5 mph British record (ED 2.46 glow conversion), Husicka's 102 mph (Czechoslovakia) with Letmo 2.4 c.c. Diesel and Prati's 100.7 mph at the Milan Internats (Super-Tigre G.20S glow). Highest (unofficial) Diesel speed: 106.9 mph by new German Mach 1.

Theoretically, the Diesel should be capable—especially with equivalent engineering and development—of delivering greater power in this displacement group, but other factors enter into the picture. For peak power, Diesel compression setting must be accurately matched to engine speed to provide correct ignition timing. Since revs pick up appreciably when speed jobs are airborne and compression setting cannot be adjusted in flight, pre take-off tuning is very critical. For this reason, Pete Wright converted his ED 2.46 ball-bearing disc-valve Diesel to glow. Though static rpm were as much as 2,000 less, speed jumped about 10 per cent. Other alterations to this motor included a new counterbalanced shaft, new conrod, opened out intake and valve disc and interior polishing. In two seasons, speed was raised from 90 mph to present 106.5.

(*Continued on page 50*)

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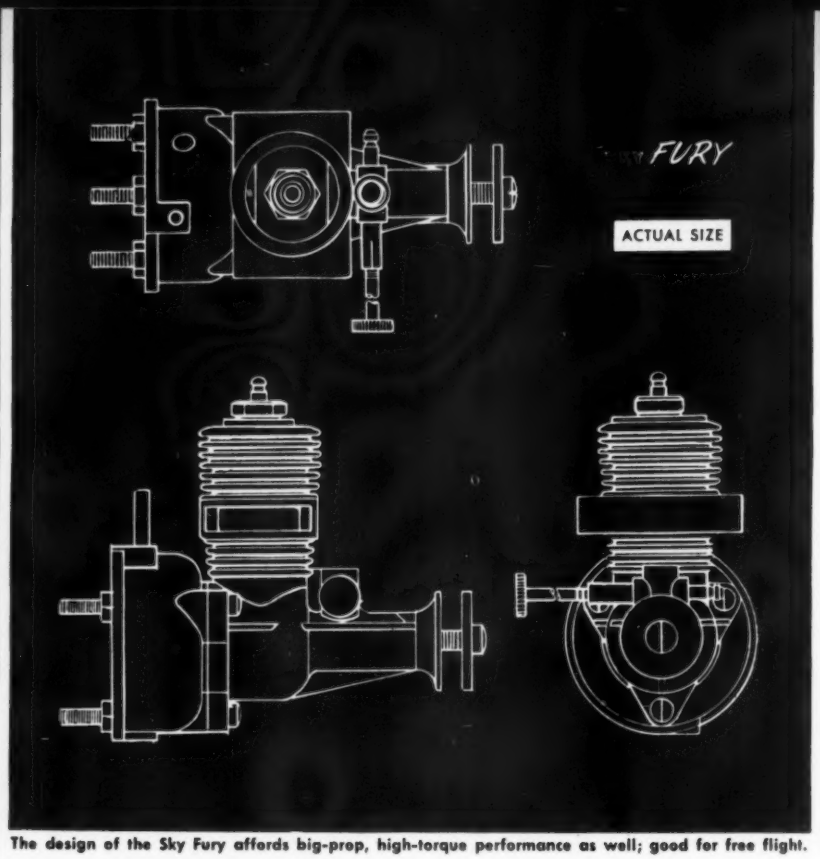
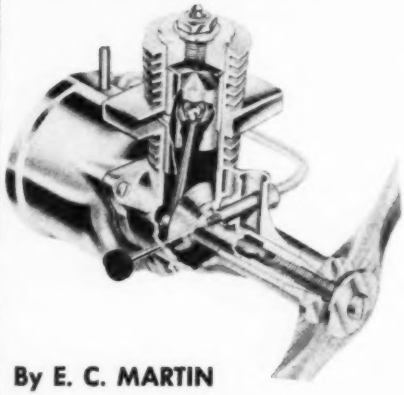


The design of the Sky Fury affords big-prop, high-torque performance as well; good for free flight.



ENGINE REVIEW

Allyn .049 Sky Fury reveals new, important improvements, runs steady, wide rpm range.

By E. C. MARTIN

A novel and most interesting engine, the Sky Fury is a refreshing departure from conventional Half-A design in almost every detail, and justifies its difference with a sparkling performance. The Allyn engineers have obviously tossed convention out of the window and made a fresh start, with a result that embodies several functional improvements which are doubly attractive because they also simplify production methods.

The basis of the Sky Fury is a neat aluminum pressure die casting which incorporates intake, main bearing, crankcase, the entire cylinder including head and fins, and large double opposed exhaust stacks. Three equally spaced radial mounting lugs of a full 1/8 in. thickness do much to eliminate the broken lug bug, and the absence of a cylinder flange thread takes most of the risk out of a careless plug change, whereas the widely used screwed cylinder assembly is prone to distortion when tightening of the plug or cylinder is not carefully done.

The cylinder barrel is accurately bored to a close slip fit for a drop-in type cylinder liner, and a shoulder at the bottom provides end location in one direction, while a plug screwed into threads at the top of the bore constrain it in the other, thus sandwiching the liner in a manner which directs all stress axially along the cylinder walls. In this way, all the bore distortion from radial thread loading common to normal screwed assemblies is removed.

A short and rather small diameter crankshaft rotary intake provides unusual flexibility and potent fuel suction, but somewhat restricts top end performance. Several other design features tie in with this carburetion characteristic to provide a great deal more torque than usual among Half-A glow engines which are almost exclusively in the high bhp at high rpm category, and the resulting big prop performance combined with usefully dimensioned exhaust stacks, long jet needle and single vent large capacity tank, makes the Sky Fury of interest to free flight scale (*Continued on page* 40)

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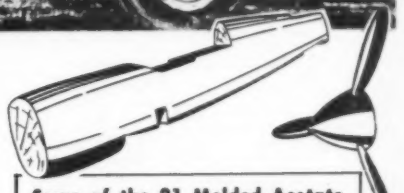
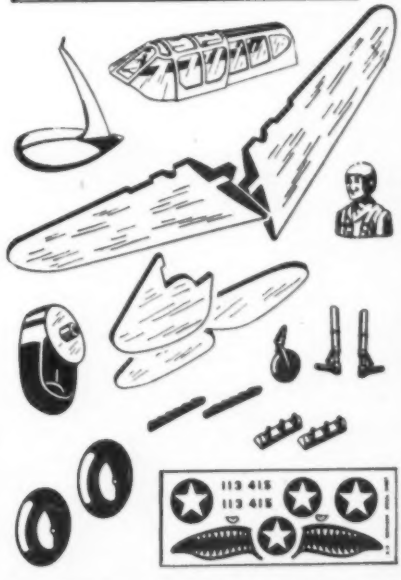


Some of the 21 Molded Acetate Plastic Parts, Finished Fuselage, wings, tails, Decals, in Warhawk Kit.



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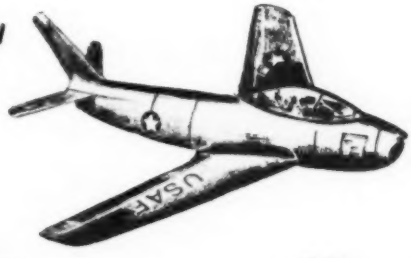

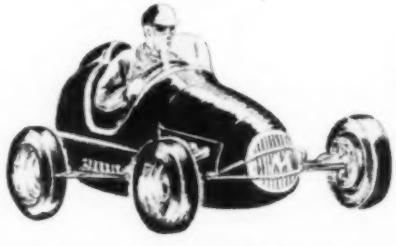

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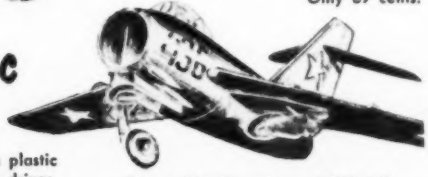

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FLASH NEWS

Russian super bombers, U. S. vertical take-offs in headlines.

By ROBERT McLARREN

▶ Rumors regarding the existence of Russian strategic bombers have been changed into hard fact by receipt in this country of actual—though unclear—photographs of two of them: the Ilyushin 38 four-engine and Tupolev 200 six-engine bombers. Both of the bombers are turboprop-powered and both feature swept wings and tails. The Ilyushin is powered by four turboprop engines, the Tupolev by six and both are of conventional appearance. The smaller bomber has long been referred to as the "Type 31" and is known to be in squadron strength at stations along the Russian northeast coast within striking distance of Alaska. The heavier Tupolev is a B-36-size bomber whose six turboprop engines give it a formidable range, most probably encompassing strategic U.S. targets. The photographs reveal radomes and remote-control turrets familiar in U.S. practice. It seems certain that the atom-laden Convair B-36, which has long been held as the single greatest deterrent to war, has now been matched by the Russians, whose possession of the atomic bomb is now generally recognized. But it had to arrive someday.

Counteracting this ominous news is the clear fact that the U.S. isn't sleeping in the matter of defense against these Russian bombers. In addition to work on guided missiles, jet fighters and the radar network, it may now be revealed that rapid progress is being made in "VTO" aircraft. Capable of "Vertical Take Off," these new combat interceptors are not to be confused with convertiplanes, which are often called "Vertical Risers" to distinguish them. The VTO craft was pioneered by the Nazis during World War II with the Ba 349 "Natter" piloted missile, which was launched vertically by rockets and glided to a landing under pilot control. The U.S. approach to the problem is a propeller-driven interceptor which is fired vertically by rockets from a launching rack and climbs rapidly to its target as something akin to a highspeed helicopter. Convair and Lockheed are said to have completed prototype VTO craft, both powered by an Allison T40 turboprop engine turning counter-rotating propellers (or rotors, if you like). Bell Aircraft is re-entering the aircraft field with a VTO development. And just to nip a question in the bud: the landing is made tail-first under pilot control using the controllable-pitch propellers to ease the machine down. Yes, it sounds like Buck Rogers, but so did guided missiles and jet fighters a decade ago!

The first U.S. convertiplane, the McDonnell XV-1 (for "Vertical Riser") is already considered a "conventional" machine by the VTO men. The XV-1 is one of three (Bell and Sikorsky) basic designs under development and the first to be completed. It takes off vertically as a regular helicopter, its three-blade rotor being propelled by McDonnell-developed pressure jets at the tips. Compressed air for these jets is produced by a familiar Continental piston engine mounted in the aft fuselage. At the prescribed altitude, the output of the engine is changed from the compressor to the shaft of an old-fashioned two-blade pusher propeller and the XV-1 moves forward.

As forward speed is picked up the rotor blades begin to stall and the flight load is shifted to the conventional wing. And there you have a convertiplane! The XV-1 carries a pilot and two observers or two litters and will be evaluated by the Transportation Corps of the U.S. Army as an artillery spotter. The Bell XV-3, which has not yet been completed, uses the "tilting rotor" principle in which two laterally-disposed rotors lift the machine into the air to cruising altitude, at which point the rotors swing forward through a 90° arc to become propellers for forward flight. The Sikorsky XV-2 project, which has been discontinued, was designed to fold up the rotor blades after attaining desired altitude and proceed as a conventional airplane.

Largest turboprop airplane in the U.S. has flown, the big Douglas YC-124B Globemaster taking to the air with its four Pratt & Whitney YT34-P-1 turboprop engines of 5,500 hp each. These powerful engines replace the 3,500-hp P & W *Wasp Major* piston engines in the production airplane and the added power gives the giant a top speed of more than 350 mph. The added power, too, made necessary a higher fin and rudder and a raised stabilizer to accommodate the increased downwash from the engines. Not a prototype, the YC-124B is loaded with test instrumentation to enable the Air Force to determine full data on the turboprop version as compared with the conventional model.

The B-36 Bomber, despite its aging against jet competition, is still a long way from being dead and Convair announces the B-36J version is now in production. This latest model has a gross weight of 400,000 lb., making it the largest airplane in service and the greatest weight ever lifted into the air. (The Hughes Flying Boat had a projected gross weight of 400,000 lb. but has made only one flight at very light weight and may never fly again.—Ed.) Handling this increased weight is a strengthened landing gear and supporting structure. The additional 12 tons of load go into fuel to stretch the range to 12,000 miles, enabling the mighty B-36 to reach *any city in the world* from a U.S. air base!

Ficon mystery has finally been dispelled with revelation that the "parasite" plane to be carried in the belly of the B-36 will be the Republic RF-84F and not the F-84F with which the experiments have been made to date. The difference lies in the fact that the RF-84F is an unarmed, long-range photo reconnaissance plane, which would be released from the high-flying B-36 to obtain photographs of target areas at very high speeds. However, since no RF-84F was avail-

(*Continued on page* 49)

Come on, Hal—tell the "Big Boys" how you do it!

Hal Roth of
Richmond, Calif.

Hal won a record-smashing first place in the model Clipper* Cargo PAA Load Event at the '53 NATS. His 6-oz. model carried 23¼ ounces of payload—a ratio of weight empty to payload which never has been approached by the "Big Boys" in full-scale aviation!

PAA LOAD EVENTS

You're reading about the hottest activity in competitive aviation modeling!

Sponsored first by Pan American in 1948, these weight-carrying events for free-flight gas models have caught on like wildfire. This year they will spark many local and regional meets—and the spotlight will be on PAA Load Events at the NATS.

In designing your entries, remember that the purpose of the event is to encourage the building and flying of model aircraft which resemble full-scale airplanes with respect to *carrying a payload safely through the air.* After all, isn't this the basic purpose of commercial aviation itself?

Start on your PAA Loader now. For rules and specifications for 1954, write to: Educational Director, Pan American World Airways, 28-19 Bridge Plaza North, Long Island City 1, New York.

*Trade-mark, Reg. U. S. Pat. Off.

PAN AMERICAN

WORLD'S MOST EXPERIENCED AIRLINE

NEW!

PITT'S SPECIAL

LITTLE STINKER

SCOOP! Here's Betty Skelton's championship stunt flyer . . . never before at this low, low price. It's one of the snappiest, most colorful stunt flyers that ever took to the air. The completely prefabricated kit features: carved balsa fuselage, all the colorful decals, formed balsa wing, plastic pilot, Jim Walker's U-Control, etc., etc. — everything cut, formed or shaped for easy assembly. **2.50**

POWER WITH ANY SMALL BORE ENGINE (.020 TO .074)

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AMERICAN BOY

STUNT TRAINER

18" WINGSPAN FOR .020 TO .074 ENGINES

Here's our new, popular U-Control trainer . . . the biggest dollar's worth of model airplane in the whole wide world. It's a 100% complete — 100% prefabbed. BEGINNERS . . . Assemble it in "nothing flat," add your engine — and away you go! EXPERTS . . . you'll love this inexpensive profile job for your experimental work — for testing new flying techniques. **1.00**

NORTH AMERICAN

TEXAN AT6

18" WINGSPAN FOR .035 TO .074 ENGINES

An AIR TRAILS "Blue Ribbon" award model. It's our authentic scale replica of the world famous U. S. Air Force AT6 Trainer. The Navy calls it their "SNJ". Modelers everywhere call this exciting control-liner a real "thriller." The completely prefabricated kit includes: Jim Walker's U-Control, carved balsa fuselage, formed wing, cowling, etc. **1.95**

FREE Scientific Catalog . . . Contains all our exciting action models: Airplanes, Speedboats, Race Cars, Etc.

BOEING F4B-4 $2.95
SPAN: 17½" For .020 to .074 Eng. Deluxe U-Control model. 100% complete—100% prefabbed . . . with carved balsa fuselage, metal tail, rubber wheels, pilot, etc.

LITTLE MERCURY $1.50
SPAN: 18" For .039 to .074 Eng. Carved fuselage model — at this sensational low price. It's completely prefabbed . . . easy to assemble, easy to fly. Jim Walker's U-Control.

CURTISS HAWK $2.95
SPAN: 17½" For .020 to .074 Eng. Deluxe U-Control model of the U.S. Army's famous "Hawk" fighter. 100% complete . . . 100% prefabbed. Contains carved balsa fuselage, etc., etc.

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For .020 to .049 Engines
Imagine! This carved fuselage biplane "beauty" for only $1.50. It's semi-scale. Features Jim Walker's U-Control, all prefabricated parts.

LITTLE MUSTANG
SPAN: 18" For .020 to .0
Famous escort fighter mod
pletely prefabbed. Feature
balsa fuselage, formed bal
etc., etc.

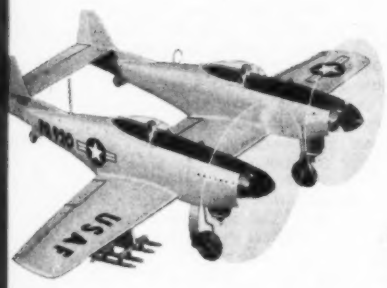
LE DEVIL **$1.50**
18" For .020 to .074 Eng.
...omically priced U-Control
Easy to build and fun to
Prefabbed parts include:
balsa fuselage & wing, etc.

BUCKEYE JR. **$3.95**
LENGTH: 14" For .020 to .074 Eng.
Full speed ahead for thrills with this "beaut" of a speedboat. Prefabbed model is 100% complete—carved balsa hull, brass fittings.

RIVIERA **$3.50**
For "½ A" Eng., Electric Motors
Authentic Chris-Craft replica with a 12" carved balsa hull and brass metal fittings. All parts finished. Completely prefabbed model.

SEA HAWK **$2.50**
"½ A" Eng., CO_2, or Elec. Motors
Features our exclusive aeronautical fin and rudder design. Prefabbed model has a 12" carved balsa hull, brass metal fittings, etc.

BEL AIR **$2.95**
SPAN: 18" For .039 to .099 Eng.
Deluxe speed, sport & stunt flyer. Features carved balsa fuselage, formed hollow balsa wing, etc., etc. — all satin smooth finished. U-Control.



NEW!
NORTH AMERICAN F-82 TWIN MUSTANG

18" WINGSPAN FOR .035 TO .074 ENGINES

The fabulous F-82 . . . first time as a control-line, fly-it-yourself model. Powers with 1 or 2 engines. TEST FLIGHTS PROVE THIS! It's super-prefabricated with 2 carved balsa fuselages, airfoil wing, 2 canopies and pilots, 2 metal cowlings, 2 landing gears, etc. **$2.95**

BOEING P-26A

18" WINGSPAN FOR .020 TO .074 ENGINES

Our popular P-26A . . . in honor of the U.S.A.F.'s first all metal pursuit plane. This highly colorful model brings to life all the beauty of the prototype. It's a terrific control-line stunt or sport flyer. The super-smooth prefab kit contains a carved balsa fuselage, formed metal drag ring, etc., etc. **2.95**

ODELERS:
E THESE SCIENTIFIC MODELS
YOUR FAVORITE HOBBY SHOP
...o dealer is available, add 10¢
...tage & packing) to cost of model

BE SPECIFIC SAY—

SCIENTIFIC

Mr. Stanley Ziemba, Jewett City, Conn., sent us this photo of his Scientific P-26A. Stan says: "... It's a beaut and flies like a dream."

NEW!

LITTLE BUCKEYE

You're in store for exciting action with this sleek speedboat. It's prefabbed for super-easy assembly. Just wait till you see it in action . . . it's positively sensational! Power it with any "½ A" engine, electric motor or Jetex. The big-value kit features a fully carved balsa hull, brass metal fittings, etc., etc. **1.95**

At your Comet dealer

Kit No. SP-1

The COMET LOCKHEED

$2.49

Starfire F94-C

Newest of the Comet Jet Fighters—A Flying Scale Model Designed for JETEX POWER

* 10 Formed Plastic Parts; Finished Bubble Canopy
* Lightweight Silkspan Covering
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* E-Z-open Jet Motor Access Hatch

—and many other welcome features

Wingspan (with wing tanks) 23⅛"—length 25". Latest fighter ordered into production for our Air Force. Amazingly realistic model. Fuselage designed to take a Jetex 150 engine and Jetex augmenter tube for extra power. Plan provides flying instructions.

Comet Cement— Big Tube—10c

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HERE'S WHAT YOU'VE BEEN WAITING FOR

NYLON ORANGE WHITE 1.15 PER YD.

Light weight, strong, ideal for all types of planes 36" width

SILK ORANGE RED YELLOW WHITE 95¢ PER YD.

36" WIDTH

Please send cash, check or money order. Sorry, no C.O.D.

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MODEL BUILDERS'

MAHOGANY

SHEET & STRIP

THE IDEAL WOOD FOR PLANES, SHIPS & BOATS

★ HIGH QUALITY, LOW COST
★ STRONG, LONG GRAINED
★ 1/28" UNIFORM THICKNESS
★ WIDE SELECTION OF SIZES
★ LARGE ASSORTMENT OF SHEETS & STRIPS . . . $1.00, postpaid
★ OR SEND FOR FREE PRICE LIST

THE TENNESSEE MODEL CO.

BOX 764, KNOXVILLE, TENN.

Dealers' & manufacturer's inquiries invited

Engine Review

(*Continued from page* 36)

enthusiasts. Viewed in this light, a slightly longer intake would probably improve carburetion still further, and greatly facilitate handling and the attachment of an extension for cowled installations.

A nickel plated brass spraybar, with a split female thread frictioning device, is press fitted into substantial bosses on either side of the intake, and the delivery side has a bore that is smaller than the maximum diameter of the needle taper so that a positive fuel shut-off is available if required.

Every effort has been made to reduce crankcase volume and charging loss to a minimum. The bearing end of the crankcase is accordingly hemispherically shaped with a small annular projection to sustain the thrust loading of the crankdisc, and the disc itself is heavily chamfered to suit, and also to clear the overlap of the piston at bottom dead center. The two alternative backplates supplied are arranged to butt up as close to the crankpin as possible and are stepped for piston skirt clearance.

Aluminum pressure die castings of substantial proportions comprise the combined backplate and radial tank mount, and alternative regular backplate, both being formed to match the crankcase mounting lugs. The tank blends into a bell shape in order to provide a mounting face of large area, and to accommodate a large fuel supply without excessive overhang. Only one vent tube is fitted and this extends down into the tank in such a way that fuel level when filled is only slightly above the jet with the engine in a horizontal position. A boss is cast into the bottom of the tank, however, which can be easily drilled for a lower vent tube, and the existing upper tube can be replaced by one of appropriate length to produce a simple stunt tank. The plastic delivery pipe extends through the usual hole in the top to the tank bottom, and owing to the lack of a second vent it is wise to use the delivery pipe for filling if carburetor flooding is to be avoided. Three mounting bolts are supplied which also serve to retain the tank and tank backplate. Vellumoid gaskets are used at both joints.

The case hardened steel crankshaft is of average dimensions for the displacement, having 7/32 in. outside diameter, 5/32 in. dia. gas passage, and 1/8 in. dia. crankpin. A circular valve port of 5/32 in. dia. is used, which is ample for the size of air intake. Apart from a most excellent surface finish, the crankshaft is interesting because it is hollow through its entire length, and the prop retaining bolt is the only agency which opposes crankcase leakage. In practice there is slight oil seepage of no consequence, apart from which the system seems very satisfactory. The payoff on this feature goes to the man and machine that tap the hole. It is considerably quicker to tap than the usual blind variety. A fairly abrupt taper provides keying action for the aluminum prop driver and an aluminum washer and blued steel bolt retain the special 6 x 3 Sky Fury (Top Flite manufactured) prop supplied.

A machined aluminum conrod with ball jointed small end and outstanding crankpin fit and finish is retained on a recessed boss inside the hardened steel piston by a cup which is swaged over rod and boss to form a permanent assembly.

The piston skirt is about 30 per cent longer than usual for the displacement, and as a result, exceptional life may be expected from both piston and cylinder, as loading is distributed over a larger area and better guidance reduces piston rock. However, we seldom get something for nothing, and the above benefits are offset, to some extent, by the necessarily longer cylinder and the increased total crankcase volume arising from the greater internal volume of the piston. This is actually a limiting factor for ultimate performance which has already been prevented by the intake and shaft valve, so in the final reckoning the piston dimensions may be taken as an asset, as it is under heavily loaded conditions that the Sky Fury excels.

The Meehanite cylinder liner is extremely interesting as it employs a bypass porting system that is unique in this country, while paradoxically being almost universal among European engines. It takes the form of four grooves which appear to be holes with an imaginary center inside the bore diameter, which is indeed exactly how they are made. A plug is inserted in the bore, during manufacture, which has four holes in it that break out of its outside diameter. An end mill inserted in each hole then chews a crescent shaped groove out of the cylinder wall to a depth corresponding to the height of a normal bypass port. The final result is a port and bypass passage produced in one machining operation. The piston, of course, provides the inside wall of the passage. The advantages are smooth gas flow and excellent piston lubrication, while the disadvantages devolve on the manufacturer in the form of worn or broken end mills and bore honing difficulties.

The cylinder wall has to be slightly thicker and heavier than usual to accommodate the grooves, but, as a result, has a resisitance to distortion and heat conducting quality that would be an asset to most of the conventional designs.

Two opposed exhaust ports, each covering about 160° of the bore circumference, are located just above the bypass grooves to provide valve events of typical nature for a radial ported engine. Piston crown and combustion chamber, however, have flat faces, which, contrary to expectations, did not seem to produce excessive charge loss or dirty exhaust.

The head, as already mentioned, is an aluminum plug which screws into the main casting to bear on the top lip of the cylinder liner, with a plasticized gasket between, and has a pair of small flats projecting about 1/16 in. above the casting for wrench application.

An interesting glow plug is supplied. It has a very large volume recess and an element in the form of a "W" pointing downward. During the test, conventional plugs were substituted and it was found that few gave such good results at any speed and none at very low speed, where a point could be found at which no other would sustain running unless the battery was connected.

It was also apparent on the test that the Sky Fury has remarkable range of speeds over which it will run steadily.

A sticking tendency between piston and cylinder may be in evidence in a brand new engine. This is a common peculiarity of the materials used and will disappear eventually. It has no effect on performance and occurs only during hand cranking.

TEST: Allyn Sky Fury .049

Plug: 1/4 x 32, Short reach as supplied, 1-1/2 volts to start; Fuel: O & R AA; Running Time Prior to Test: 2 hours; Bore: .390 in.; Stroke: .400 in.; Weight: 1-3/4 oz.

Power Prop	*RPM*
6 x 5	10,000
6 x 4	11,000
6 x 3	12,900
5¼ x 5	12,200
5¼ x 4	13,200
5¼ x 3	14,300
Top Flite	*RPM*
6 x 5	9,500
6 x 4	10,700
6 x 3	12,000
Sky Fury prop supplied	12,400

END

Facts about Microfilm

(*Continued from page* 13)

water and is about 4 in. larger all around than the wire hoop used is satisfactory. Oilcloth placed over a simple wooden frame and filled with water will do. The temperature of the water should be about 65°.

Aluminum clothesline wire, about 1/8 in. diameter, is excellent for the hoops. I use a kitchen pot to bend it round and all-rubber electrician's tape to hold the handle part together. Take considerable pains to make the hoop flat.

Saliva is used as an adhesive to stick microfilm to framework. Rubber cement diluted about 10 times with benzine has been used. I use Esso spot remover plus some varnish and find it works very well, especially on ultra light construction. The Esso spot remover can be purchased at some gasoline dealers. Any adhesive, except saliva, should be first tested to see that it does not dissolve the microfilm.

How to make and cover with "mike" is shown in the accompanying sequence of pictures.

END

Radio Control News

(*Continued from page* 26)

given, based on .0014 in. thick copper, is that amount needed to cause failure of the copper by excessive heating. However, one half of that amount for a given size line is perfectly safe and is many times more than is needed for RC work.

One of the first questions that arises is: "What good is it and what do I gain by using it?" The final product is the ultimate in neatness. Done commercially, each and every finished card is precisely the same, thus achieving a uniformity heretofore almost impossible. Coils can be made in this way and positioned in the circuit so that the inductances and capacitances involved are the same on each card, thus reducing testing time and de-bugging. Also, there are no loose wires to break or become entangled. We have in effect a "two dimensional" wiring layout. Components such as resistors, capacitors, etc., are then placed in position in holes which have been drilled in the small "lands" where connections are made to the conductor. Some manufacturers place eyelets at each point of soldering.

Here we have a word of caution: *do not* use a heavy hot iron when making the solder connection. We've found the popular Ungar pencil iron with a 1/8 in. diameter tip in the 37-1/2 watt heating element to be an ideal iron. For solder we recommend No. 18 gauge Ersin 60/40 solder. This low melting point solder can be obtained from most radio supply houses or from Control Research.

Begin soldering by first heating the component lead slightly and then touching the iron to the copper pattern at the time the solder is applied. Too much heat will cause the bond between the copper and base to break loose, or even blister the base material. When soldering a component into an eyeleted hole, such as is used on the North American receiver, it is important to make sure the solder flows not only from the eyelet to the component lead but also from the eyelet to the conductor pattern.

Besides the conventional conductor patterns for receivers or transmitters, we also have, in this new medium, excellent means of making limit switches or rotary commutators or sequencing switches. In the past, segments were made by cementing thin pieces of brass, copper or tin to a base material. This method, while workable, is crude at best. Our new method is more precise. The bond strength between copper and the base is better and the copper segments are thin enough vastly to improve brush operation.

We hope this gives you a little idea of the

A Whale of a record!

TOP FLITES AND POWERPROPS
113 FIRST PLACES
...in 6 years of NATIONALS COMPETITION!

THE WINNERS USE 'EM—WHY NOT YOU!

For six years now, more Nationals winners have used TOP FLITES and POWER PROPS than any other make. In the 1953 Nationals, more "Props of Champs" were used than all other makes *combined!* Here is a record that means Quality, Performance and Dependability...for you.

You can get TOP FLITES and POWER PROPS — at Model and Hobby Shops — everywhere.

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LOOK FOR THIS PROP CABINET AT YOUR LOCAL DEALER...
it contains FREE prop charts showing what size prop to use in the average engine-and-airplane combination.

MULTIPLE ESCAPEMENT
$6.50
WEIGHS LESS THAN ½ OZ.

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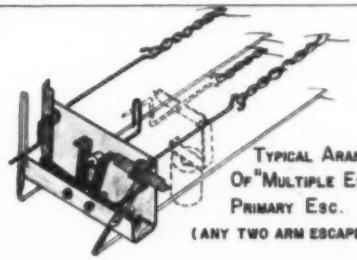
$6.50
(NOT SHOWN)



TYPICAL ARRANGEMENT OF "MULTIPLE ESC." AND PRIMARY ESC.
(ANY TWO ARM ESCAPEMENT)

JOIN THE MANY WHO ARE NOW INSTALLING OUR MULTIPLE ESC. FOR THIS SEASON'S FLYING. EVERYONE CAN NOW EXPERIENCE THE THRILL OF MULTI-CONTROL WITH THIS UNIT, WHICH HAS RECEIVED PRAISE FROM ALL OVER THE WORLD AS ONE OF THE FINEST DEVELOPMENTS FOR THE R.C. FAN.

YES, FULL CONTROL OF BOTH RUDDER AND ELEVATOR WITHOUT THE NEED OF EXPENSIVE AND COMPLICATED AUDIO MODULATED EQUIPMENT.

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Cheminol's NEW APPROACH to the Glow Plug Problem is STRAIGHT TO THE POINT! ABSOLUTELY INDESTRUCTIBLE insulating material. This means an end to plug failure due to faulty insulation! A more rugged iridium platinum element which is corrosion-proof and delivers 500 to 1000 MORE RPMs. Need we say more? Take a new approach to glow plug satisfaction—see your hobby dealer today and learn the full facts. NO INCREASE IN PRICE—just 65c.

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Radio Control

COMPARE THESE TRANSMITTER FEATURES

27¢ mc, completely wired and tested. Large steel case - 5"x6"x9" - with largest area resting on ground. Complete unit is ready to operate with all necessary accessories included - tube, crystal, hand held switch, quick-mount antenna (less batteries).
Cat No. T $20.00

Transmitter with built-in meter for tuning
Cat No. TM $22.50

Kit for Cat. No. T transmitter, partially assembled (all major components mounted and ready to wire)
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E. N. Harmon Electric Co.
412 E. Washington Blvd.
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Include postage with above orders
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R/C HILLCREST (Brand) BATTERY BOXES

2 cell Pen. 45¢ | 2 cell Med. 45¢ | 4 cell Pen. 85¢

Developed especially for Radio Control work. Cells may be connected in series or parallel. Coil spring loaded, floating contacts on each end of the cells eliminates electrical 'noise' caused by contacts rubbing under vibration.

Made of high impact styrene plastic. Non-warping and fuel proof.

If not yet available at your dealer, order direct. Send cash, check or M.O. No COD's please. We pay postage. Dealers, Jobbers write now for details.

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possibilities of this method of construction. Tune in next month for more design and some construction information.

New Items

This month we continue our presentation of the various components used in RC work, with a review of miniature and sub-miniature variable capacitors for both receiver and transmitter work. Strictly speaking, not all of these are "new items," but are best grouped for the sake of clarity and cohesiveness.

Capacitor A is the familiar ceramic variable as made by Erie or Centralab. Adaptable for either receiver or transmitter tuning, they come in ranges from 1.5 to 7 mmf and up to 7 to 45 mmf. The Centralab unit is type 822 and the Erie unit is type TS-2A. B shows the Erie type 557 which is a very small and lightweight trimmer. This type may be had on a plastic base as shown on the left, or minus the base as shown on the right. Good for receivers or low powered transmitters. In sizes from 8 to 50 mmf. Item C is a Centralab type 829 tubular trimmer, available in ranges from .5-3 mmf to 1.5-10 mmf. Excellent for trimmer use, it is compact, lightweight and may be mounted in a single round hole. D is the standard APC air trimmer made by Hammarlund in a wide variety of values. E. F. Johnson also make a similar type. Air trimmers of this type are recommended for transmitters, frequency meters and wavemeters. Also okay for receivers if the size and weight can be tolerated. Type E is a Hammarlund MAPC model. This is a miniature version of the previously mentioned APC air trimmer. Available in a wide range of values. For the ultimate in sub-miniature transmitter design we have the E. F. Johnson model M, as shown at F. This ultra compact and lightweight air trimmer comes in four sizes in the conventional single type, ranging from a maximum of 5 to 20 mmf. Also made in a differential and butterfly model for builders having special applications for these types.

All of the above mentioned variable capacitors may be obtained from your local radio supply shop, although some may have to be specially ordered. Control Research, Berkeley Models, Ace Radio Control, Essco and other RC suppliers can also serve you with some of these items.

The latest news in batteries is the new Burgess 1-1/2 volt Heavy Duty Industrial cell. Available at present in the D size, this cell is made of a completely new, artificial mix. This revolutionary mix increases shelf life, life under service and the recuperative powers of the cell. This new cell should be a "must" for Large B and Class "C" RC models. Available through your local Burgess dealer or distributor.

Electronic Specialty Supply Company of 58 Walker St., New York City, now has a new relay tube for our two-tuber set. Known as the MPC-1, this tube has a 40 mil filament and will pass over 3 mils through a 5,000 ohm relay. Similar in size to the familiar XFG-1, this $1.95 hard tube should increase the relay tube life to near infinity, barring breakage, and also give increased efficiency.

As this goes to press we learn of a new producer of tuned reed relays. Radio Control Specialties of 377 W. Eighth Street, Eugene, Ore., should now have these ready for the market.

Babcock Radio Engineering Co., Van Nuys, Calif., does it again. A newcomer to the model radio control field, this firm has long been a supplier of target drone equipment to the government and builders of commercial and industrial receivers and transmitters. Their latest addition to the success of RC work is a three-channel unit giving rudder, elevator and engine control. The 2-7/8 x 3 x 5 in., 16 oz. receiver has a range of two miles, is virtually crashproof and features all the same type tubes for ease of replacement, and its "one adjustment" tuning feature makes it the acme of simplicity to operate. The hand-held transmitter features a four-position control stick, to give realistic "feel" to the operator. The transmitter also features one tuning adjustment and a radiation indicator. The 500, 720 and 1,620 cps tones are amplitude modulated up to 85 per cent. For the rabid RC fan and builder this looks like the ultimate in model radio control units. The pictures show the excellent design and workmanship on the Babcock BCR-4 and BCT-4.

We've just received the latest catalogue sheets from Ace Radio Control of Higginsville, Mo., and find they are ideal advertisements for the novice in the field. Photographs of all kits offered give the buyer a first hand picture of what he is getting. Not a bad idea.

Club News

William Rassbach of 624 Clyde St., Pittsburgh, Pa., dropped us a short line on the doings of a few of the members of the DC/RC club. Leo Miller controls his 5-ft. Arden .199 powered job on 220 mc. While on the subject, Carl Hermes of Arlington, Tex., wants some information on 220 mc RC equipment. This might be a chance for the DC/RC boys to do a little education work on a frequency other than 27 or 52 mc. Jim Reed, of the same club, has K & B .15 powered semi-scale Cessna L-19 with a three-tube receiver; operates proportional control on the rudder and elevator.

While not exactly concerning club news, we did talk to Art Lagrange of Wappingers Falls, N. Y., recently regarding the use of a gas tube as the first stage of a reed receiver. Seems as though Art has a very nice receiver using this arrangement which also operates a Sigma relay on the RF carrier. This is in the plate circuit of the RK-61 in the first stage. To go one farther, we note in the British publication Aero Modeller that one of their chaps has operated an ED reed bank from a *single* XFG-1 and has obtained about 1,000 ft. range.

From Albuquerque, N. M., we are reminded of a very important safety item. This concerns the sharp end of the vertical wire antennas emanating, unsuspected, from the camouflaged confines of your model. Personally, we bend a 1/4 in. diameter loop on top of the antenna, but it just never occured to us to mention it before. A small balsa sphere, painted yellow, red or orange and attached to the tip end also should be satisfactory. Let's keep looking into the safety angles; they're important!

It seems that we're missing out on some top notch information when we fail to hear from RC clubs within large engineering organizations. We know they exist but for some odd reason they keep to themselves. How about hearing from some of these groups? One thing we've found out recently is that too many individuals or groups are hesitant about divulging their "secrets." During our many years of modeling and manufacturing, we've found this to be one of the quickest ways to have a good thing die a natural death. Get your idea into print and it will help both you and the reader.

The Radio Control Club of Detroit is out to make the Detroit area the RC spot of the East. They have a fine perpetual trophy. All persons interested, no matter where they live, are urged to write to E. S. Kratzer, 1112 Book Bldg., Detroit, Mich., for information about this year's meet. The novice flier is urged to attend, along with the expert, since there will be separate groupings for each class. In this way the beginner has a real chance. An excellent idea to get RC contests rolling, and not have them just another addition to a larger contest. END

Contest Calendar

APRIL

4—*Taft, Calif.*: Taft Condor's Record Trials for FFG. Francis Stewart, Contest Director, 900 21st St., Bakerfield, Calif.

25—*Fresno, Calif.*: Fresno Gas Model Club Record Trials for FFG. Jim Scheidt, C.D., 2225 Brown, Fresno, Calif.

25—*San Diego, Calif.*: Class AAA Uptown Exchange Club and San Diego Modelers' Meet for CL, CLS, combat, FFG, RC, OHLG, and TLG. George G. Wagner, Sr., C.D., 6851 Newbold Ct., San Diego 11, Calif.

MAY

2—*Marysville, Calif.*: Class AA Fifth Annual Exchange Free Flight Contest for FFG, PL, TLG, and OR. Lyman C. Armstrong, C.D., 229 B St., Yuba City, Calif.

9—*Santa Ynez, Calif.*: Class AA Second Annual Omnimeet for FFG, TLG, and OR. Stanley D. Hill, C.D., 1020 State St., Santa Barbara, Calif.

15—*Brooklyn, N. Y.*: Class AAA Ninth Annual Mirror Model Flying Fair for CL, CLS, FFG, PL, CC, beauty, RC, combat, TR, and Navy Carrier. Entry is restricted to 1,000 contestants. Art Hasselbach, C.D., c/o Mirror Model Flying Fair, 235 E. 45th St., New York 17, N. Y.

16—*Milwaukee, Wis.*: Class AA Milwaukee Flying Electrons' Radio Control Meet. Victor Weissbrodt, C.D., 2100 E. Webster Pl., Milwaukee, Wis.

23—*Hartford, Conn.*: Class AA Greater Hartford Team Race. Richard Matava, C.D., 358 Prospect Ave., Hartford, Conn.

23—*Easton, Pa.*: Model Airplane Doctors' Invitational Meet for FFG, CLS, CL, TR, combat, TLG, OR, RC, beauty, and PL. For information, contact William F. Andrews, 114 E. Wilkesbarre St., Easton, Pa. Pending.

29 & 30—*Los Angeles, Calif.*: Class AAA California Model Airplane Championships for CL, CLS, CLFS, combat, Navy Carrier, TR, FFG, OR, TLG, OHLG, IHLG, IR, and RC. R. E. Gass, C.D., 2864 Rutgers Ave., Long Beach 15, Calif.

30—*Fresno, Calif.*: Fresno Gas Model Club Record Trials for FFG. Jim Scheidt, C.D., 2225 Brown, Fresno, Calif.

JUNE

5—*Bronx, N. Y.*: Pending.

5 & 6—*Goodland, Kan.*: Class AA Northwest Kansas Meet for FFG, CLFS, CLS, CL, combat, and RC. Kenneth Armstrong, C.D., Goodland, Kan.

11 & 12—*Alexandria, Minn.*: Class AAA meet. Clyde J. Newstrom, C.D., 119 Fifth Ave., West, Alexandria, Minn. Pending.

13—*San Diego, Calif.*: Class AA San Diego Aeroneers' PAA Load Contest. George G. Wagner, Sr., C.D., 6851 Newbold Ct., San Diego 11, Calif.

20—*Hagerstown, Md.*: Class AA meet. Pending.

(*Continued on page* 54)

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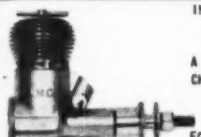

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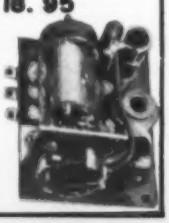

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RC the "C" pays off!

(*Continued from page 20*)

ment. This is especially true when yoke at both ends of the linkage are bent in the same direction. The whole linkage then acquires momentum that causes the rotating arm of the escapement to bounce off the pawl, then to go by the pawl without engaging. The escapement usually appears to miss one-rudder position regularly with engine running.

A cause of linkage jamming is a loose fitting, single bearing bellcrank. The most efficient arrangement is the torsion rod, made of square balsa, or telescoped lengths of brass tubing or a single length of aluminum tubing. Push-pull linkages place the escapement under varying loads when the ship is in extreme nose-down and nose-up positions—elevator weight especially may prevent a push-pull from working, even when counterbalanced. The weight of the surface when deflected puts much of the control weight and all the linkage weight upon the escapement, greatly taxing its ability to function. Such a load is transferred through a bellcrank to the escapement.

Sharing the criminal line-up with the escapement is the relay. What we need badly is a good American polarized relay, designed expressly for RC work. Arguments rage over Kurmans and Sigmas—more lately, over other makes. Though enough of a favorite to be termed the old stand-by, the Sigma leaves much to be desired. The Kurman is comparatively difficult to adjust since it has no screw contacts. The coil tension spring may shift slightly on the attachment tab, altering adjustment, or the wire, attaching to the armature, may sometimes have a slight effect. The light arms supporting the contacts often are reinforced by soldering a pin along the frame. The Sigma, on the other hand, seems solid and heavy, with adjustable screw contacts. But adjusted in a warm shop, it may wander considerably on the meter, on a winter's afternoon, or when the temperature changes drastically during the day. The coil spring varies tension under such conditions. Even a mild crack-up may displace the heavy coil, or twist the armature so that one corner touches the pole piece. But whatever the relay, unless it is a sealed type, it is imperative to check its adjustment before every flying session, and to see that the contacts are clean. These contacts will become dirty, sooner or later preventing current from flowing to the escapement, and control is lost.

Newcomers to RC activity seldom realize the importance of not allowing the relay armature to come into contact with the magnetic pole piece. If it does there is danger of the relay parts becoming magnetized, causing sticking of the armature and contact. This may be guarded against by placing a piece of cigarette package cellophane over the end of the pole piece. Cement the ends, maintaining minimum distance between armature and pole piece. Later Kurmans have the pole piece end treated to prevent this condition.

Dirty contacts are caused mostly by arcing or sparking across the contacts. Work the radio in a dark room and you may observe a fat spark at each operation of the relay. This spark should be suppressed with the appropriate resistor and condenser across the contacts. Nevertheless, contacts will have to be kept clean. This can be done with a small brush dipped in carbon tetrachloride. Never sandpaper or file the contacts as a rough surface practically will stick, spinning-in the plane, or at least cause improper controlling.

Wiring, and the attendant sockets, jacks, pots, etc., contribute many failures. Wires should be grouped together where possible, and fastened to the cabin interior walls or floor, even if added length is necessary. Where the wires solder to switches, battery boxes, etc., a small pigtail to absorb vibration is a good precaution against its snapping off. Pin plugs and sockets require special handling. On the plug end, where the receiver cable terminates, wrap the adjacent portion of the cable with tape. This helps prevent pulling loose one wire from a pin when working the plug into and out of the socket. The reverse side of the socket should have the soldering tabs slightly spread to prevent accidental touching and should be well coated with cement to prevent vibration from breaking off a tab. Toggle switches are preferred.

Batteries, of course, cause more mishaps than all other things combined but this is mainly the result of negligence or miserliness. Any $75 plane and radio—and think of the time!—should be worth new A batteries every flying session. Discard batteries well above the so-called minimums and you'll never be caught short. Not only read voltages under load—that is, set turned on—but maintain that load for a number of seconds to detect any gradual falling off. A battery that appears to read okay, even under load when read quickly, may sag off after five seconds or so. Read escapement battery voltage at the escapement, not at the battery box. Plug-in, or snap-on, battery attachments, should always be held firmly in place with a rubberband. Vibration sometimes shakes them off. One of our errant ships returned after three months; had a B battery lead hanging loose!

Batteries may fail abruptly as a result of rough handling. One transmitter failure was traced to a clerk who had dropped a B battery during wrapping. An internal connection had let go. Some receiver B batteries have a construction vulnerable to dropping. Two-pin transmitter keying lead plugs should be examined before use. Careless skinning of the wires or soldering may allow an occasional closing of the lead when moved about, causing a steady signal and spin. Microswitches occasionally fail. Such switches, pots, etc., should be replaced once the plane has an impressive history of successful flights. Parts don't last forever.

Most of us simply fly until something goes wrong and, if the corpus delicti is found, engage in strenuous post mortems. Frequently, forthcoming trouble telegraphs itself by an occasional missed signal or a wrong escapement movement. Once you assume, but are not sure, that you made a mistake, be of a suspicious mind. Any momentary loss of control should finish your flying for the day. Any malfunctioning, however slight, is the forerunner of complete failure. You cannot win by taking chances.

It is better to organize a checking procedure, to be accomplished religiously between flying sessions, preferably on the night before:

1. Trace the wiring, looking for incipient breaks, and lightly wiggle the soldered connections.

2. Inspect the escapement for burrs; it should run down the rubber knots until only a few knots are left; if friction is found in the escapement and its linkage, get things working freely.

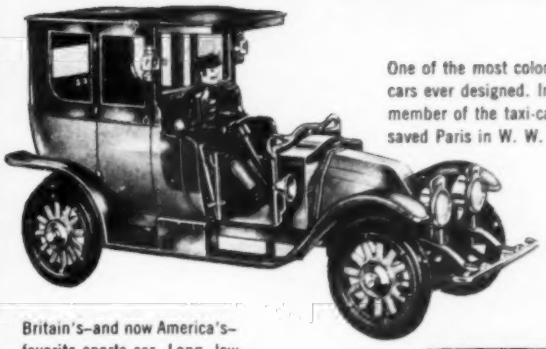
3. Check the relay operation with a pot for correct operation. Clean the contacts, if a half-dozen flights were made.

4. Check all battery voltages, current on, both receiver and transmitter. In the case of the escapement, hold the relay over if necessary, and read at the escapement. If batteries even make you think of minimum voltage, change them. It is better to start every serious session with batteries that will extend through it without field changes. If you expect to have to make battery changes within a few flights, do it now. Forget anything you ever heard

(*Continued on page 46*)

FAMOUS NAMES IN FOREIGN CARS

1918 Limousine by **Renault**



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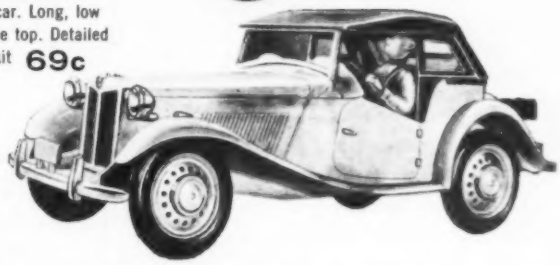

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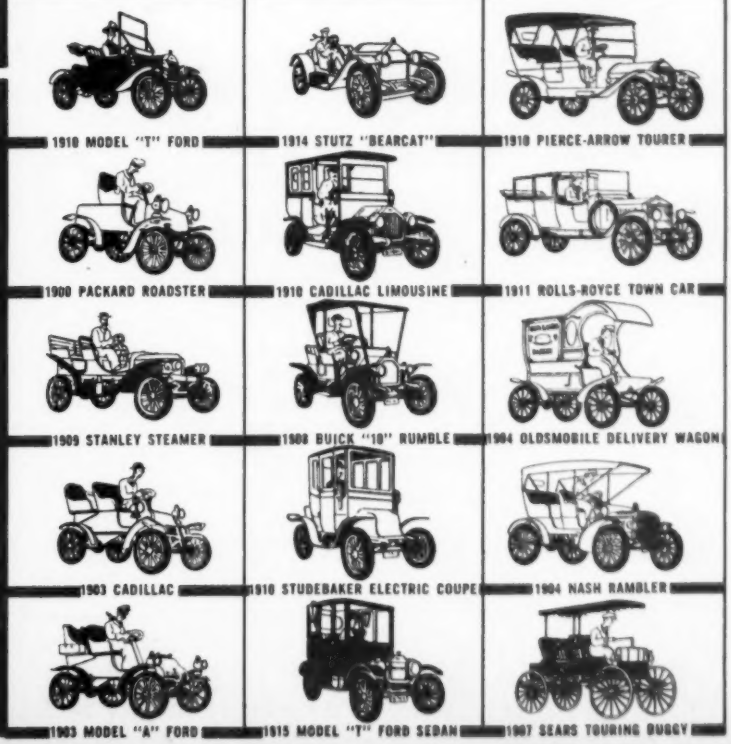

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HOTTER 'N THAT: Fox-powered stunter. April' 52.

SUPER SAUCER: Soaring towline glider. April '52.

BEAVER: Controlline model for .19-.29's. Feb. '52.

ZENITH: Taibi Class A '51 Nats cabin job. Feb. '52.

HALF WILD GOOSE: Half A free flight. Dec. '51.

FIRECRACKER: Flying scale U-control. Dec. '51.

about minimum voltages, especially in any high drain outfits as long flights may get you into trouble.

5. Make sure of the transmitter output with a field strength meter. If you don't have one, make this check on the field.

6. Make the check include wing hold-down rubbers, rubberbands for the stabilizer (if necessary), the condition of the escapement rubber, and all the equipment needed for the flying session, such as glow plug, boosters, leads, props, fuel, tuning wand, meters. Make a check list in the beginning and fasten it on the box. Check off each thing that is done. Later you won't require reminders. Disorganization on the field won't add to peace of mind. Hectic efforts to fly invite disaster.

7. On the field, again check receiver voltages, then make ground check. Know how long your motor will run on a given amount of fuel and minimize flight durations, except when a long flight (as at a contest) is necessary. Many a beginner gets into trouble within 30 seconds with a ship out of trim in the wind, then listens to an eight-minute motor run.

8. Establish a procedure before launching. Wind the escapement, or at least look at the rubber between flights. Be sure the radio and escapement operates engine-off, before making the flight. Before the actual launch, you can check out escapement action with the engine running.

If the plane cracks up, however superficial the damage, or even if apparently unharmed, check the receiver tuning and relay operation. The relay adjustment is easily altered; if the receiver does not move, its component parts may be loosed, or bent out of shape and, in this respect, a Sigma 4F relay is an extremely vulnerable gadget.

The faithful routine, the system, is the real secret to running up the flight count. You have got to have a system.

—William Winter

END

Man At Work

(*Continued from page 9*)

and gave out a few helpful suggestions. At first, the people just couldn't believe that they were getting something for nothing. By 1 p.m. the word had really gotten around and so many Ceiling Walkers had drifted with the wind over the controlline circles that many of the contestants got their ingenuity working (as modelers will!). A girl spectator had high time of 48 sec until she was beaten by several Stunt contestants who turned in flights between 50-55 sec. By 4 p.m. Albert Pomeroy, a member of the Glenside Air Scouts of Glenside, Pa., put one up nearly 00S for a duration of 1 min. 2 sec.; he used four strands of rubber, well lubricated, and put on some 750 turns. I doubt if it was a thermal flight. He had lightened the Walker to some extent. Was awarded the swell camera Jim Walker had donated.

* * *

▶ Model planes are wonderful, alrighty, but over-addiction may incur teacher's disapproval or wifely indignation. Consider, then, the case of Fred M. Muncher, Birmingham, Ala. Fred works in a pipe shop and came home one night to find Mrs. Muncher a nervous wreck. She had dreamed a burglar was in the house. When she tried to investigate, there, guarding the bed, was a yellow and black Live Wire. When she finally got past it, there was a barrier of drawings and plans. A fuel pump reached for her, and sheet balsas flew at her from all sides. A wing reached from ceiling to floor and whenever she moved toward it, an RC stab would flap its elevators warningly. Then she woke. Everything in its place, no one in the house. Fred took a two-week break. As for us, it will be a four-week break. See you next month.

END

Yardbird

(*Continued from page* 21)

before doping on the tissue. Cover the fuselage with Jap tissue if possible. Water shrink the tissue and give one coat of thinned clear dope.

The tail surfaces are made from 1/16 in. square balsa and are covered on both sides with Jap tissue. They may be water shrunk and clear doped if they are pinned down to a flat surface during the shrinking and doping process.

Select medium hard 3/32 in. square balsa for the wing leading edge. The trailing edge is made from 1/16 x 1/8 in. medium hard stock. All wing ribs are cut from 1/32 in. sheet balsa. Build the wing in right and left panels.

Trim and sand the leading and trailing edges to form the proper airfoil. Block and pin the wing panels in place over the plan to give the correct dihedral of 1-1/2 in. under each wing tip. Insert the cut and shaped leading and trailing edge pieces for the center section and add the 1/16 in. square spar pieces. Use good glue technique and allow ample drying time.

Give the completed wing framework a final sanding and a coat of clear dope. Cover the wing in sections to avoid wrinkles, applying the dope to the outlines of the wing sections only. Do not dope the tissue down to each wing rib. Water shrink the tissue and brush on one coat of thinned clear dope. It is best to block and pin the wing during the shrinking and doping process to minimize warping.

Various propellers may be used with the Yardbird. The 7-in. props shown are the plastic, the Paulowina wood, and the machine-cut balsa blank which are available at most hobby shops.

The prop shown on the completed model was finished from the 7-in. balsa blank. It requires the most work in finishing but it is the lightest and most efficient. The Paulowina prop is also quite efficient though a little hotter. The plastic prop is the easiest to install but it is the heaviest.

With any of these props a small free-wheeling device will improve the glide. The device shown is simple and foolproof. Cut a piece of 1/16 in. diameter aluminum tubing and insert and bend a piece of straight pin as indicated. The bends are made at right angles so that the top pin is pressed against the prop when the lower pin is engaged with the winding hook. Bind the tube unit in place with light thread and cement. Form the winding-hook-connecting-pin part of the prop shaft, and then slide on the prop, washers, and nose button. Form the motor hook after assembly of the prop-nose-button.

Begin final assembly of the model by cementing the stabilizer and the rudder in place. Check alinement carefully. Add the 1/16 in. sheet tail skid.

The wheels shown are made from 2 ply 1/16 in. sheet balsa laminations. Use 1/16 in. diameter aluminum tubing for bushings with 1/4 in. copper washers as collars. A drop of cement on the axle ends will hold the wheels in place.

Dope on black tissue to stimulate the cabin and give the nose and wheels a coat of colored dope of your choice.

Cement the 1/32 x 1/8 in. balsa wing mount pieces in place on the fuselage. Cement the wing directly to these mounts. Although this is a rigid mounting, little if any crash damage will result with a model this light.

Make up a four-strand motor from 1/8 in. flat T-56 rubber. Lubricate the motor thoroughly before installing. Use light rubber tubing on the prop hook to protect the motor. Use a piece of 3/32 in. dowel for the rear motor pin.

Balance the model for a long flat glide,

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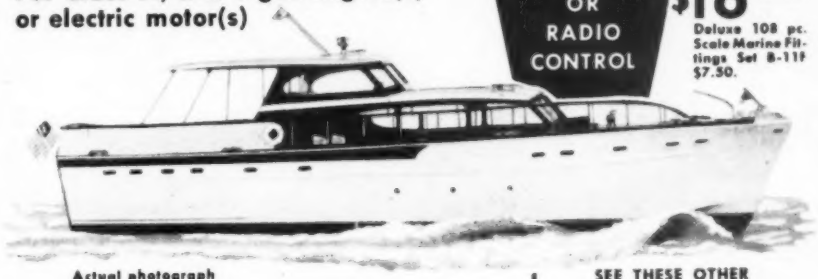

Actual photograph of model built from kit.

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F-51 Mustang	S-2	2.95
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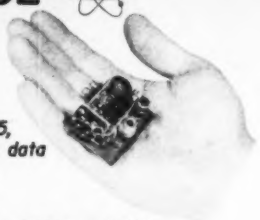

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Bill of Materials

Three pieces 1/16 x 1/16 x 36 medium hard balsa: fuselage, tail surfaces.
One piece 3/32 x 3/32 x 16 medium hard balsa: wing leading edge.
One piece 1/16 x 1/8 x 16 medium hard balsa: wing trailing edge.
One piece 1/32 flat balsa: wing ribs.
One piece 1/16 flat balsa: rudder, wheels, motor pin receivers.
One piece 1/2 x 1 x 1-1/8 medium soft balsa: nose block
One 7 in. propeller, balsa, Paulowina, or plastic.
One nose button, hardwood or plastic.
One piece 1/32 diameter wire: landing gear, prop hook.
One piece 1/16 in. diameter aluminum tubing: wheel bushings, free-wheeling, balsa prop bushing.
One piece 3/32 diameter dowel: motor pin.
Six 1/4 diameter copper washers: wheels, balsa prop hub.
Two 1/8 diameter brass washers: prop bearing.
One sheet Jap tissue.
One tube cement.
One bottle clear dope.
One piece 1/8 flat T-56 rubber 40 in. long.
One bottle rubber lubricant.
(All measurements in inches)

END

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Field Strength Meter

(*Continued from page 27*)

but always advisable. The B voltage may range from 15 to 45 volts depending upon the value of meter used. When using an 0-1 ma meter, 15 volts are sufficient, and 45 volts will operate a 0-5 meter. Since the unit is on but a short time, we soldered the batteries and A cell in place.

To use the meter, when finished and in its case, switch on the unit and adjust the pot R_2 to read about half-scale on the meter. Insert a 12-18 in. antenna (a thin piece of wire soldered to a banana plug) in its socket and rotate the tuning capacitor, or slug, until the maximum dip is obtained on the meter. *Remember this*: a field strength meter gives only relative readings at a given distance from the transmitter. In other words, if the unit is held by someone, the dip will be greater than if the unit is placed on a box or bench. Once properly tuned, remove it from the vicinity of the transmitter until a .2—.5 ma dip is obtained when a signal is transmitted. *Leave the field strength meter in one position* and adjust final tank capacitor or antenna loading until the maximum dip is obtained. Be sure the field strength meter antenna and the transmitter antenna are in the same plane; that is, vertical to vertical and horizontal to horizontal. Greatest accuracy is achieved at a distance of at least one wave length away from the transmitter, or about 40 ft.

END

Models of Models

(*Continued from page 17*)

doing this, we begin to see the inherent recovery of our prospective design. The small models will be (or should be) reasonably heavy in scale weight to our bigger ships, so we can see that these small models can be launched into good or bad turns at great velocity with the power of our arm.

In the illustrations for this article, we have included a method to construct easily the dummy engine ballast that we will need to create this miniature of miniatures.

To bear out and give a little more importance to this dynamic similarity theme, we may mention that the Air Force thinks enough of dynamic similarity to spend several million dollars on small scale (1/8 to 1/10) models of some of our present actual jet planes and experimental versions of jet fighters and bombers. And these dynamically similar (yes, in weight and in all factors) models are flown free flight at tremendous speeds and tracked by radar to gain flight characteristics of these planes. Apparently these results are most encouraging.

We members of the San Valeers Model Club (San Fernando Valley, Calif.) have been playing with dynamically similar models since 1946. This year, with the help of Jose Tellez, we constructed one dozen dynamically similar models of some of the present day free flight designs. In this group, we scaled and built such models as the Sandy Hogan, Fubar, Civy Boy, Zekes, Skybeau, Tweek, Krecek's Gourd, Zipper and others. We already knew what to look for in the flight characteristics of these small models because we knew what flight patterns and idiosyncrasies these different free flight models exhibited when flown full model size.

After wringing these models out with a fairly good arm, our enthusiasm for dynamically similar models hit a new high. We found then, in the small scale versions, that the Hogan actually did fly like a Hogan, the Civy Boy like a Civy, the Zeke like a Zeke, and so on.

There may be some who will challenge the worth of these dynamically similar models. But without argument, either way, we are bound to see that these small scale models can be a lot of fun, even for the unbeliever of visible fact. These small models are entertaining for clubs who hold their meetings in, or who have access to, a gymnasium or field house. In bad weather that would hamper the flying of full size gas-powered models, model clubs can still have fun and competition by taking these small models inside or to the barn.

For the modeler who seriously builds these dynamically similar models to help sift good and bad ideas, it is best to fly in calm air or indoors. By testing these small models under moderate air conditions, we will be giving the "little models" a "little break" that is similar in scale proportion to the roaring sand storms we are apt to chuck our bigger free flights into.

END

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Flash News

(*Continued from page 36*)

able for the tests, a production F-84F fighter was modified (stabilizer bent down to clear bomb bay) for the job. This, of course, led to the assumption that the purpose of the small plane was to serve as an aerial defender for the B-36 when under enemy jet fighter attack. Strategic Air Command reveals that a number of B-36's will be converted for FICON (FIghter CONtact) trapeze installations and placed into service.

Competition is running at a white heat between the North American TF-86F and the Lockheed T-33B jet trainers for the Air Force prize of production contracts. The TF-86F is a standard F-86F *Sabre* jet fighter with an additional 5-ft. fuselage section added to accommodate a student. The Lockheed T-33B is virtually a new airplane but uses basic T-33A components. Unusual feature of the Lockheed jet trainer is the location of the instructor's seat in a raised position behind the student to allow the former full vision forward. The new Lockheed also incorporates nose slats, a tail braking parachute and an improved Allison turbojet engine of 6,000 lb. thrust. The competition is not so much simply on performance (with the 700 mph speed of the TF-86F walking away from the 650 mph speed of the T-33B) as it is on price and delivery. Both airplanes use basic components of airplanes (the F-86 *Sabre* and the T-33 trainer) that have long been in production, which means fully-developed tooling and very low production costs. The straight-wing Lockheed has the edge on low-speed handling simplicity for jet students but the performance of the North American puts the student up closer to actual current jet fighter handling. Despite the military designations of the two jet trainers, neither has yet been ordered and it will be a tight race down to the final wire.

World's largest production helicopter, the Sikorsky HR2S, has completed initial flight tests by lifting a 6,500-lb. load with ease. The big, new Sikorsky machine is powered by two Pratt & Whitney R-2800 engines mounted in nacelles on the ends of a stub wing. The engines are canted in such a manner that their drive shafts converge at the single, five-blade rotor shaft atop the fuselage. The S-56, its company title, features a retractable main landing gear to reduce drag for forward flight, which Igor Sikorsky claims is well over 150 mph, making it the fastest helicopter in the world. An ingenious arrangement in the new rotorcraft is a gear-shaft which drives the main wheels from the engine, enabling the machine to be maneuvered on the ground even when the rotor is not turning. The present model, of which three have already been completed, is only the first of an extensive development program. Sikorsky plans a turboprop engine version powered by two Allison T56 units of 3,750 hp each and a commercial passenger version, using either Allison or P & W engines for delivery in 1956. This model will accommodate 38 passengers, making the S-56 the first genuine "passenger transport" helicopter suitable for profitable inter-city operation. Los Angeles Airways is already interested.

Aerodynamic tricks are being worked on the Canadian-built F-86 *Sabre* jet fighters, but with familiar difficulties. The earlier *Sabre* swept wing used nose slats to provide increased lift at low speeds and thereby permit the airplane to take-off and land at conventional fighter speeds. Experience in Korea showed, however, that the presence of the slats—despite extremely careful manufacture—robbed the plane of speed and maneuverability at high altitude. Following North American's lead, Canadair, Inc. has replaced the slats with a solid leading edge, which delays stall buffeting in turns at high altitude and thereby improves the plane's combat maneuverability. However, as in all aerodynamic problems, this gain is not without its penalty elsewhere and the new *Sabre* lands faster and has a longer landing run. Called a "6-3" wing, the new shape adds 6 in. to the root and 3 in. to the tip, resulting in a slight increase in leading edge sweepback. But, as in every phase of aeronautical engineering, you can't get something for nothing and the new *Sabre* pays the familiar penalty. END

Quick Sixty

(*Continued from page* 15)

metal screws.

The spinner was cut down on a drill press from a 1-3/4 in. Froom to a true 1-1/2 in. spinner. This situation can be eliminated, though, as the engine can be moved back 1/4 in. and a stock Froom 1-1/2 in. spinner will fit. This will not affect the balance point, as will be described later.

Next on the agenda is the elevator. It is made of 1/8 sheet plywood and the sewed cloth hinge is used. The flipper is on the inside of the circle. Reason: pilot can see the elevator at all times before take-off and is not likely to pick up the handle incorrectly. Simple? The elevator is bolted to the pan with two 4-40 bolts.

The top crutch is next. Basswood is recommended for this part as it does not split so easily; however, white sugar pine may be substituted. Outline the pan with about 1/16 in. to spare on the 3/4 x 2-1/4 x 16 in. block. Cut outline from the block. Draw center line and cut out inside of crutch with copen, jig or bandsaw. The slot where the saw enters is where the rudder will be cemented, so saw this line straight. Cut out inside allowing 3/8 in. around the crutch up to the front of the cylinder fins. This operation saves the time killing gouging out

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of the rear section of the top half. The rudder is cut to outline, shaped, and cemented into position. Let the rudder extend all the way through the 3/4 in. block. It goes without saying that all cement joints should be pre-cemented before the piece is cemented into position.

Fit the crutch down over the motor, taking out as small amounts of wood as possible for strength purposes. The tail section should be gouged out for the elevator horn and push rod clearance.

Now for the most important part of this model: the balancing. The center of gravity was not shown on the plans as no two models ever balance alike. Turn the model upside down and balance this portion of the model (with elevator mounted) on the sharp edge of a carving blade. Mark the exact point on each side of the crutch.

Place wing on pan in a position where the CG is between the center of the lead-outs. Mark the wing and begin to carve to shape. The standard airfoil is used on the Quick Sixty—high point back 40 per cent on top and 25 per cent on bottom with center line of airfoil at 33 per cent of the thickness of the section. Reference lines are drawn on 3/8 in. pine block—zero incidence. The pine block is left at the original thickness in the center section in order to give a flat surface to cement to, and to leave extra wood to use as a faring block for the top of the ship. Wing tie downs are lined up, marked, drilled, and tapped in the pan. The wing is cemented in place with the tie downs holding the wing in place. The rear tie down block is cemented in place and tie down is drilled and tapped. Sheet balsa blocks are cemented in place in cross grain fashion.

The cowl was made of balsa wood on the original job for speed of construction, but for a long life, it is advisable to use hardwood. Drill a hole in cowl block and work out to size of diameter of fins with two layers of masking tape around them. Cut block to fit on wing and crutch. Carve outside shape, then cut air ducts and cement on top of cowl.

Carve top of ship with rounded edges and fare in block on top of wing to rounded edges. Use plastic wood to fare in joints.

The original ship had a clear finish, but the later one had a sprayed white Dulux finish with two coats of sanding sealer and two sprayed coats of automobile primer under it. A lock-on-dolly, similar to Herbert L. Davis', was used with remarkable success on all types of flying fields. END

Alkie IV

(*Continued from page* 31)

up, either spool type or parachute dethermalizer may be used. We chose the former and housed it as shown in a compartment opening at the bottom of the fuselage with the trap door actuated by a burning fuse.

For additional strength in the nose the fire wall should be covered with light gauze or silk extending aft 1/2 in. Then the entire ship is covered with lightweight Silkspan. The original model was finshed off with three light coats of butyrate dope. Bright colors should be used for good visibility.

The ship should balance approximately at the mid-point of the main wing chord. Hand glide the model as you would a conventional ship and correct for any stalling or diving tendencies by changing the incidence in the secondary wing as you would the stab on a regular free flight. Upon obtaining a flat glide, adjust the rudder tab for a slow circle to the left. When you are satisfied with the glide, make the first flight with the engine running as slowly as possible and a short timer setting, hand-launching the ship into the wind. Now increase power gradually until peak performance is obtained. END

Foreign Notes

(*Continued from page* 35)

Startling Spanish Team Racers

The FAST club certainly started something when they introduced team racing. T/R is now more popular in many foreign countries, relative to other model activities, than in the U.S. From Spain we note some quite unusual racer designs which, despite what they may lack in other directions, certainly show originality. Most startling of all was a swept-forward-wing design using a tandem landing gear with wingtip skids. Lead-outs were, however, swept too far forward for safety. Motor: Byra .15 cu. in. shaft-valve Diesel. Seen at Madrid for the Gran Premio di San Isidro was another Byra powered ship of unusual configuration: swept back wings and stab, single wheel with wingtip skids and motor under a forward canopy. Designed by Rafael Pico.

Genuine Constant-Speed Prop

A true constant-speed, variable-pitch prop has just appeared in England and will be available in the U.S. if demand is sufficient. Prop is designed to maintain engine rpm at peak output (or whatever power is selected) by automatically matching pitch to flight conditions. Prop blades also feather when motor stops. Quite a remarkable device. Full details in next month's Foreign Notes. END

Shoehorn

(*Continued from page* 19)

new and unusual without being hampered by a stopwatch.

An amphibian such as the Shoehorn is an example of a model of this type. It will never win an ROW free flight contest. It probably couldn't get off the water in the tanks usually provided at contests. This ship was designed to give semi-realistic flight and hydro characteristics and is built ruggedly enough to withstand more than a normal amount of abuse.

If you're in the market for something a little different, this may be just the job for you. Even if you don't live within miles of a sizable body of water, or can't swim, the Shoehorn is a nice performer flown as a conventional sport job with the gear down and locked. Several features of this little ship are perhaps interesting enough to mention before we get into the construction details.

The fuselage or hull design is the conventional and very popular sheet balsa type with 1/8 in. square balsa stringers at the intersection of the sides, top and bottom. In addition to an appreciable increase in structural strength, it also reduces the hazard of a cemented joint popping open and thereby allowing water to enter the hull with possibly serious consequences.

When we just "doodled" the design on a piece of scrap paper, it was decided that a "trike" gear would be the thing to have, never giving a thought at the moment to the feasibility of making it work. After one heck of a lot of head scratching and lost slumber we hit upon the arrangement shown on the plans. The nose gear (the real fly in the design ointment) is formed like a bobby pin and pressed into an aluminum tubing socket that is sewn to the first former. The main gear is held on the face of the step by three small clamps and No. 2 wood screws. In this position the ship is rigged out for land flying. To convert to ROW operation, the nose gear is slipped out of the aforementioned socket and inserted in the socket shown in the nose block. The screws in the side clamps of the main gear are removed and the gear is rotated into the retracted position shown on the plans. The two small holes in the step can be plugged by replacing the screws and the main gear is held in the retracted posi-

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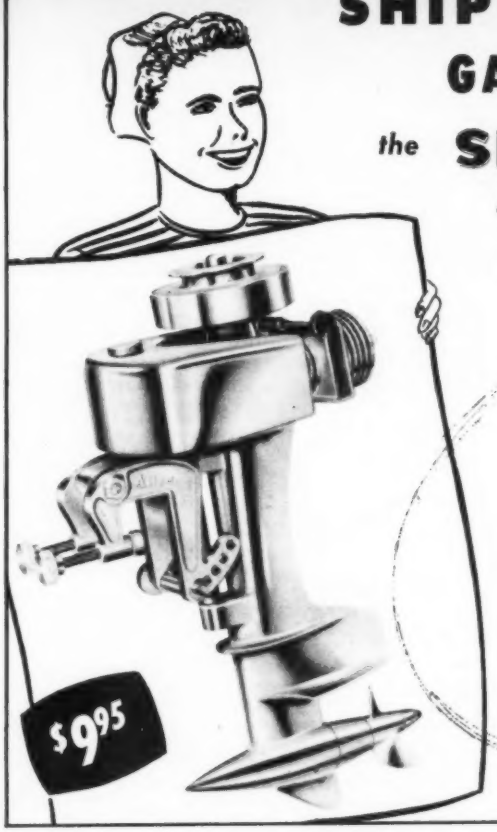

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tion with a rubber band. This arrangement overcomes the problem of severe center of gravity changes when converting from ROG to ROW and vice versa.

The hull is somewhat wider and more spoon-billed than is normal for a model. This was done in a conscious effort to eliminate troublesome tip floats or sponsons. So far, the idea seems practical, if care is exercised in ROW take-offs. To increase further the hydro stability, the engine nacelle height was kept to an absolute minimum, providing only sufficient clearance for a 6 in. dia. prop and thereby lowering the CG.

Whether or not the hull design is hydrodynamically efficient is debatable. A yacht designer friend says it could be improved and without doubt this is correct. The fact remains, however, that it works and provides loads of flying fun.

The Shoehorn is designed for .049 to .065 engines. Total weight, ready to fly, should be approximately 8 oz. Wing span is 32 in.; wing area, 165 sq. in.

The original model is covered with light green tissue, with yellow trim and black pin striping. So much for the preliminaries. Let's get on with the main event—building your version of the Shoehorn.

Cut out the sides from medium hard 1/16 in. sheet balsa. Notice where the sheets are joined together to get the proper width. Trace the outline of each of the formers on the proper type of material as indicated on the plans. Cut the formers carefully and accurately to size.

Mark the location of bulkheads No.'s 3 and 5 on each of sides and begin assembly by cementing them in place, paying careful attention to proper alinement of the sides. After the cement has dried, begin with former No. 1 and cement the rest of the formers in place.

The 1/8 in. square medium hard balsa stringers are slipped into the notches in the formers and securely cemented in place. Sand the corners of the stringers off to fair them in with the slope of the sides. The top and bottom of the hull or fuselage are cut from 1/16 thick quarter-ground sheet and carefully cemented to each former and jointed together along the center stringers.

Cut the stab platform from 1/16 in. sheet and slip it between the sides and cement in place.

The windshield fairing is cut from 1/4 in. hard sheet balsa and cemented to the front of former No. 3.

Trace the noseblock side and top outline on a medium hard balsa block and roughly carve to shape. Spot cement the block to former No. 1 and carefully carve and sand the block to fair with the fuselage lines. Pay careful attention to the sweep of the bottom lines as shown in the side and front views on the plans. The entire fuselage should be sanded at this point in the construction. Be careful not to round off the chines (junction of the bottom and sides); keep it sharp as shown in the former details.

Make up two aluminum sockets from 1/4 OD x 1/32 tubing as shown in detail by carefully squeezing in a vise. One socket is wired and cemented to former No. 1 and the other is inserted in the front of the noseblock. Then replace the noseblock, cementing it permanently in place.

The nose gear and main gear are bent to shape from 1/16 dia. steel music wire following carefully the outlines shown on the drawings. Place wheels of the proper size on the gear and retain by soldering small brass washers to the wire. Make three small clamps from .010 thick sheet brass by forming it around a piece of 1/16 wire and squeezing it flat with a pair of pliers. The main gear is held in place as previously mentioned with three No. 2 x 3/16 round head brass wood screws.

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the fuselage should be given at least three coats of clear dope and a final sanding before covering with tissue or lightweight Silkspan. The covering material should overlap about 1/8 in. at the chines and at the junction of the sides and top. For maximum strength and toughness the noseblock may be covered with silk or nylon. After covering, the fuselage should get three coats of clear dope outside and also in the cabin area. The original was covered with dyed tissue, eliminating the necessity for colored dope and keeping the weight down to a reasonable figure.

To finish the fuselage, the wing and stab hold-down dowels are placed as shown and the .010 thick celluloid windshield and windows cemented in place.

The basic wing construction is undoubtedly "old hat" to all, so we will refrain from any tedious step-by-step procedure. Instead, let's talk a little about some of the points that are a little out of the ordinary. Note, during construction of the wing, that a 1/8 in. space is left between the W-2 ribs to accommodate the 1/8 in. thick plywood engine nacelle keel. This unit should fit snugly between these ribs after the leading edge and center panel have been covered with 1/16 in. soft sheet and the dihedral formers are in place. Care should be taken during construction of the wing to aline ribs W-2 squarely with the leading and trailing edges to insure proper alinement of the engine.

The sides of the engine nacelle keel are covered with 1/16 sheet balsa after it is assembled to the wing. Cheeks, carved and sanded from soft balsa blocks, plus the 1/8 in. ply firewall are cemented to the nacelle as shown. The firewall should be drilled for the particular engine used and may be mounted with small wood screws. If your engine does not have an integral gas tank, an eyedropper, located as shown, may be utilized.

Some 1/16 in. thick sheet balsa is used to construct the fairing from the top of the fuselage to the wing center panel. The wing should be alined properly and pinned to the top of the fuselage to insure accuracy between the face of the fairing and the fuselage. The entire wing assembly should be covered with dyed tissue or lightweight Silkspan. Six coats of clear dope will insure a watertight covering job and reduce the weight of the ship in the long run by reducing the amount of moisture the frame work will absorb.

The rudder and stab are of the simplest design. The rudder is made of 1/16 thick medium hard sheet, while the stab is cut from medium hard 3/32 thick balsa. Anti-warp strips, accurately cut from sheet, are carefully fitted in slots cut in the rudder and stab as shown and carefully cemented in place. Soft balsa fairing blocks are cemented to the rudder and stab and carefully carved and sanded to blend in with the fuselage. In addition to improving the appearance, these blocks add materially to the strength of the cemented joint between stab and rudder.

The empennage group, like the rest of the ship, should be covered with tissue or span and given two coats of very thin dope.

The finished ship should balance on, or very near, the front spar, as shown on the plans. Any wide variations from this point should be compensated for by the addition of weight to the nose or tail, whichever is required. Carefully sight along the wing and tail surface for any signs of warping. Any that may be present should be steamed or doped out before going any farther.

Flight testing, to be on the safe side, should begin by hand gliding into a patch of soft grass. Adjust wing and stab incidence angles to obtain a smooth straight glide with just a trace of stall. First power flights, as with glide tests, should be attempted over land. Initial attempts should be made with reduced power, gradually increasing the throttle settings until full power is attained. Power flight path should be almost perfectly straight, with a smooth, steady climb. Offset engine thrust line as required to remove all traces of power turn.

At this point in the flight testing, a little left turn should be added to the glide path, but not enough to affect powered flight, to

(*Continued on page 54*)

"THE ~~"LIVE WIRE"~~ Cruiser"

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NEW!

A fine new 100% Radio Controlled model, very realistic in appearance, exceptional in performance, high in quality.
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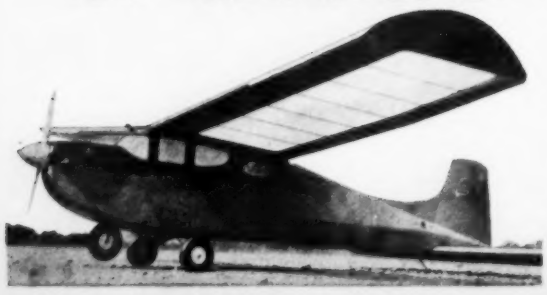

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SPECIFICATIONS:
Wing Span: 65½"
Wing Area: 775 sq. inches
Wing loading: Min. 13 oz./sq. ft.; Max. 20 oz./sq. ft.
Weight ready for flight: 4 to 6 lbs.
Bare model weight: 3 lbs.
Power: .19 to .23 engines
2 or 3 wheel landing gear as desired

Kit Contents:
- Full size working drawings
- Complete instructions including radio installation
- All necessary hardware
- Ducol gear
- R/C Ballonak end bars
- Grade A/1 materials
- Precision finished parts
- Decals

Complete Kit $14.95

Exclusive Feature
New, More Compact R/C Unit
- Remove entire R/C gear in less than one minute!
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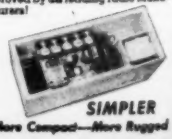
- Removable unit can be switched between several models!
- Changes can be easily made.
- Approved by all leading radio manufacturers!



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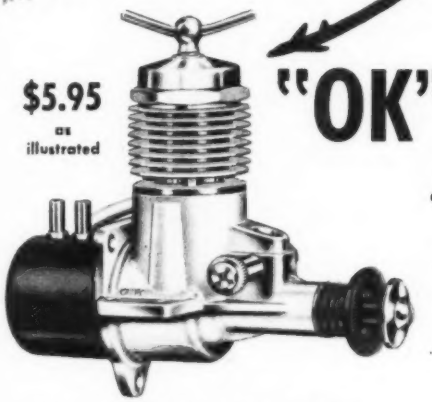

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Disp.: .049 cu. in. or .83 cc.
Height: 2 3/16"
Weight: 1½ oz., including fuel tank

***Also* — "OK" CUB .075 DIESEL** Disp.: .075 cu. in. or 1.25 cc.; Height: 2⅜"; Weight: 2 oz., including fuel tank $7.50

Both the .049 and .075 Cub Diesels include radically new and improved features which enable these rugged little power plants to "roll with the punch." Exclusive shock absorber pad and pulsating contra piston (patents pending) minimize impact stresses . . . protect running parts against premature failure.

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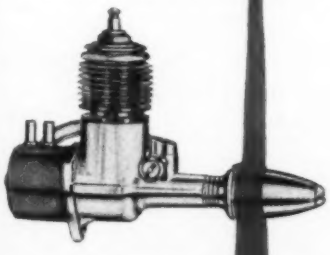

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Maximum output at higher RPM. Extended prop mounting permits easier, safer fuel adjusting. Sold complete with fuel tank, glow plug, propeller and spinner.

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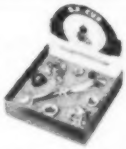

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Long Beach 13, California

Shoehorn

(*Continued from page 52*)

keep the Shoehorn within walking or swimming distance. After the ship is flying satisfactorily over terra firma, the initial water flights can be made.

The gear should be retracted for all ROW flying and the ship hand-glided several times to make certain the balance point has not changed.

ROW take-offs require a great deal of practice and patience but are well worth the effort. If your Shoehorn has been adjusted properly over land, no trouble should be experienced on the bounding main.

You haven't lived until you've spent a warm Sunday afternoon flying a hydro job. Try it and see! END

26 & 27—*Detroit, Mich.*: Class AAA Michigan State Exchange Model Plane Meet for CL, CLS, CLFS, OR, and FFG. F. P. Sposite, C.D., 9900 E. Jefferson, Detroit 14, Mich. Entry is restricted to residents of Michigan.

27—*Fresno, Calif.*: Fresno Gas Model Club Record Trials for FFG. Jim Scheidt, C.D., 2225 Brown, Fresno, Calif.

27—*Baltimore, Md.*: Class AAA Second Annual Friendship U-Control Olympics for CLS, CL, CLFS, TR, combat, Navy Carrier, beauty, and a special "clobber" event. F. G. Stroh, C.D., RFD #6, Pasadena, Md.

27—*Long Island, N. Y.*: Class AAA Seventh Annual Long Island Championships for FFG, PL, and Jetex. Edwin W. Howe, C.D., 168-01 144th Ave., Jamaica 34, N. Y.

JULY

3 & 4—*Detroit, Mich.*: Metropolitan Detroit Model Plane Contest. Merrill C. Hamburg, C.D., 4315 Audubon Rd., Detroit 24, Mich. Pending.

4—*Concord, N. C.*: Class AAA Modelairs' Championship Contest for CL and FFG. James M. Kilgore, C.D., 232 Guy St., Concord, N. C.

11—*Hackettstown, N. J.*: Class AA Second Annual Model Plane Meet. Louis F. Schierbaum, C.D., Willow Grove St., Hackettstown, N. J. Pending.

11—*Pittsfield, Mass.*: Contest for CL, CLS, CLFS, and combat. Leo Koziol, C.D., 6 Hayes Pl., Piitsfield, Mass. Pending.

18—*Milwaukee, Wis.*: Class AA Milwaukee Flying Electrons' Radio Control Meet. Victor Weissbrodt, C.D., 2100 E. Webster Pl., Milwaukee, Wis.

18—*Greenville, O.*: Class AA Jaycee Model Plane Meet for FFG, OHLG, OR, and CLS. Jim Trissil, C.D., 215 Wayne Ave., Greenville, O. Pending.

19-23—*Biggs AFB, Tex.*: Air Force World Wide Model Airplane Contest. Pending.

25—*Gettysburg, Pa.*: Class AA Gettysburg Model Airplane Club's Third Annual Model Air Meet for CLS, combat, TR, CL, FFG, and beauty. John H. Pitzer, C.D., 9 Hanover St., Gettysburg, Pa.

25—*Fresno, Calif.*: Fresno Gas Model Club Record Trials for FFG. Jim Scheidt, C.D., 2225 Brown, Fresno, Calif.

27—August 1—*Chicago, Ill.* Class AAAA 1954 National Championship Model Airplane Contest.

AUGUST

29—*Pennsylvania*: Class AAA Pennsylvania State Exchange Clubs' Meet. Pending.

29—*Fresno, Calif.*: Fresno Gas Model Club Record Trials for FFG. Jim Scheidt, C.D., 2225 Brown, Fresno, Calif.

SEPTEMBER

5 & 6—*Monticello, Minn.*: Class AAA Sixth Upper Midwest PAA Load Meet for PL and RC. W. H. Billett, C.D., 2548 Nicollet Ave., Minneapolis, Minn.

6—*Far Hills, N. J.*: Class AA Bedminster–Far Hills Lions Club Annual Control Line Meet for CL, beauty, CLS, TR, and combat. Pending.

26—*Fresno, Calif.*: Fresno Gas Model Club Record Trials for FFG. Jim Scheidt, C.D., 2225 Brown, Fresno, Calif.

OCTOBER

31—*Fresno, Calif*: Fresno Gas Model Club Record Trials for FFG. Jim Scheidt, C.D., 22225 Brown, Fresno, Calif.

NOVEMBER

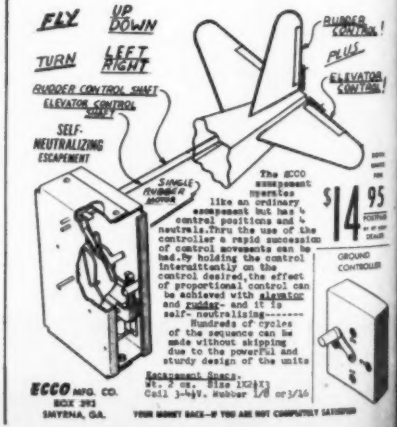
28—*Fresno, Calif.*: Fresno Gas Model Club Record Trials for FFG. Jim Scheidt, C.D., 22225 Brown, Fresno, Calif.

DECEMBER

26—*Fresno, Calif.*: Fresno Gas Model Club Record Trials for FFG. Jim Scheidt, C.D., 22225 Brown, Fresno, Calif.

KEY to LISTING of EVENTS: FFG—Free Flight Gas; CL—Control Line Speed; OR—Outdoor Rubber; TLG—Towline Glider; IR—Indoor Rubber; OHLG—Outdoor Hand-launched Glider; IHLG—Indoor Hand-launched Glider; CLS—Control Line Precision (Stunt); CLFS—Control Line Flying Scale; RC—Radio Control; TR—Team Racing; FFFS—Free Flight Flying Scale; PL—PAA Load; CC—PAA Clipper Cargo.

Contests designated "Pending" mean the application is before the proper authorities as we go to press;; "Record Trials" mean no prizes, but a chance at cracking the records; "Class A" is a meet with restricted entry; "Class AA" is a meet with unrestricted entry; "Class AAA" is a state-wide or regional meet; "Class AAAA" is a national or international meet.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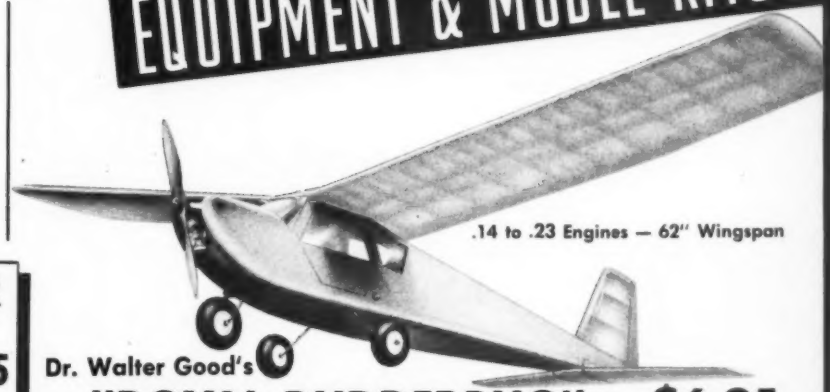

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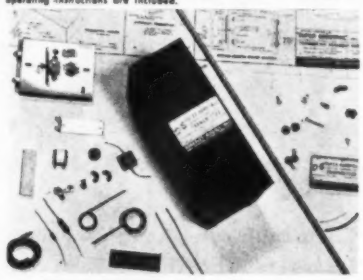
- Operates on 27.2 mc. • Weighs 3.5 lbs.

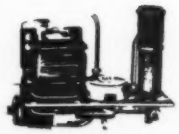
Kit includes all necessary parts (except tube and batteries); Precision Ground Crystal; Painted Metal Cabinet; Finished Sectional Antenna; stamped and formed chassis with all holes punched; all necessary components, resistors, condensers, coils and chokes; color coded wiring. Can be assembled in less than two hours. Complete building and operating instructions are included.



"Super Aerotrol" Dust Core Tuned

RECEIVER

In Kit Form less tube **$13.95**



- NEW "locked-channel" dust-core tuning.
- Light in Weight, 2¾ oz. less batteries.
- Super-regenerator circuit, dependable.

Kit includes: Finished, tested sensitive relay; finished dust-core tuner; drilled bakelite base with condensers and eyelets attached; all electrical components, condensers, resistors, coils, chokes and potentiometer; all necessary contacts, and color-coded wiring. Can be assembled in less than two hours. Complete instructions are included.

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Variable Camber Wing for Radio Control Flying!

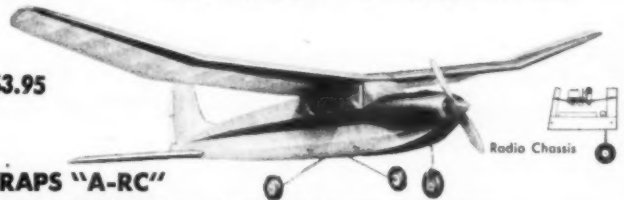
Slotted flaps may be depressed 10° for free-flight; depressed 25° for slow speed radio control flying; or raised 5° for high speed radio control flight.

Army Liaison YL-24

"HELIOPLANE"

For .049 to .14 Engines 38¾" Wingspan—1" Scale

$3.95



Radio Chassis

BOOTSTRAPS "A-RC"

For .09 to .14 Engines — 54" Wingspan

(Empty weight 21 oz. — Radio, Equip., 14 oz. max.)

Split rudder tab for separate trim adjustments. Clip-in prone engine mount, tri-cycle gear.

BRIGADIER "R. C.-38"

.035 to .099 Engines—38" Wingspan

This completely re-designed "½ A—A" Free-Flight may be flown as a Radio Control job, a PAA-Load model, or a free-flight Sport Flyer. **$1.95**

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58" Wingspan—For .19 to .36 Engines

Especially designed by Henry Struck for Radio Control and PAA-Load flying. **$4.95**

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This great new model makes an ideal Carrier event airplane, as it handles so easily! No trouble catching the arresting gear with this model.

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For Stunt Events and Navy Carrier

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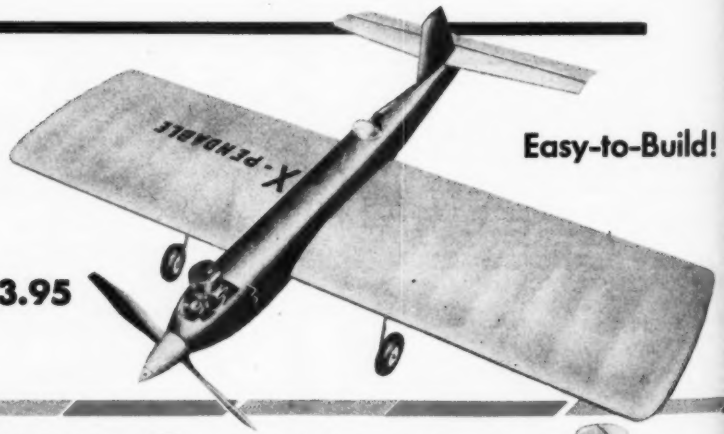

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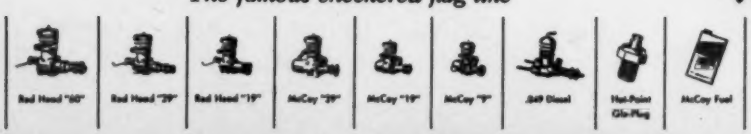

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